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THE INTERRELATIONSHIP BETWEEN EMOTION AND CARDIAC FUNCTION.[1]

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ANY physician interested in cardiology is often confronted with the popular conception that emotional disturbances are intimately related to diseases of the heart. Many medical and non-medical persons believe that emotional upsets are common causes of breakdown of cardiac function, even precipitating death. In a series of 100 consecutive insurance claims, there were two in which specific exciting arguments in business conversation were alleged to be the immediate precipitating cause of a fatal heart attack, and in seven others general stresses and strains were blamed for the onset of myocardial infarctions.

This stimulated me to look more closely into the relationship between heart diseases and emotional disturbances; I realized from reports by these claimants' own medical attendants that this supposed intimate connexion of mental tension and heart disease is a common opinion among medical men. For the purpose of this study I have tried to classify the various possible relationships as follows: (i) neurosis: (*a*) in patients without organic heart disease, (*b*) in patients with organic heart disease; (ii) the influence of emotional stresses on the genesis of organic heart disease; (iii) mental symptoms as the result of heart disease: (*a*) neurosis; (*b*) psychosis; (iv) iatrogenic heart disease.

It has been estimated that up to 50% of patients seen in cardiological practice have no organic heart disease; to these we have to add patients with emotional disturbances and organic heart disease. This shows that this problem becomes numerically quite an important one. Looking for references, I was surprised to see how relatively little has been written on this subject. Excellent textbooks on heart diseases devote a few back pages only to this important aspect of cardiology, and though usually most of the essential features are mentioned, the description is not detailed enough to inform the inexperienced.

Anatomy and Physiology.

There is ample anatomical and physiological evidence of intimate relationship between the autonomic centres in the brain and the cardio-vascular system. Karplus and Kreidl (1927) showed that electrical stimulation of the

[1] Read at a post-graduate meeting at Nambour, Queensland, on September 21, 1958.

hypothalamic area caused acceleration of the heart rate, rise in blood pressure, sweating and other manifestations of stimulation of the sympathetic nervous system. They also showed the existence of descending pathways from the hypothalamus into the spinal cord and the sympathetic chain. Beattie, Brow and Long (1930) found extrasystoles occurring on electrical stimulation of the same region.

Fairly recent investigations by Kaada (1949) and others have shown the importance of the limbic system in autonomic function. This system is phylogenetically the oldest part of the cerebral cortex (allocortex), and functionally is closely associated with the hypothalamus. Stimulation of this system leads to autonomic activity, such as defæcation, urination and cardio-respiratory changes. Attitudes resembling attack, defence and escape develop in the animal. Stimulation of other parts of this region lead to involuntary sexual activity. It appears that these old parts of the brain are concerned with emotional behaviour, whereas the neocortex is related to intelligence and intellectual performance, such as discrimination and deliberate inhibition and stimulation of autonomous behaviour patterns.

There is no doubt, then, that there is neural connexion between the cerebral cortex and the heart. It is significant that autonomic reflex control is phylogenetically old and primitive, whereas voluntary control rests in the neocortex and is acquired.

That direct stimulation of the peripheral division of the autonomic nervous system results in physiological changes in the cardio-vascular system is too well known to be discussed in detail.

Neurosis.

Master (1952) states that in collected series of cases of heart diseases in the literature, the number of functional heart disturbances not due to any organic disease varies between 20% and 50%. Of 1000 consecutive patients in his cardiological practice, he found 38% without organic heart disease.

From time immemorial, common usage in all languages refers to the heart as being intimately related to emotional disturbances. We use, and are exposed from infancy to, expressions such as hearty, heartfelt, light-hearted, broken-hearted, lion-hearted and others. As doctors we see a great number of patients who are disturbed and worried by these purely physiological changes which accompany emotional stimuli. The clinical picture is known to us under a variety of names, such as Da Costa's syndrome, neuro-circulatory asthenia, cardiac neurosis and effort syndrome. Wood (1941) expresses the opinion that this syndrome as an entity should be relegated to the history of medicine. With this I fully agree. All investigations have shown that there is no evidence that the cardio-vascular system is in any way ætiologically or anatomically implicated. I also concur with Willius (1937), that the attitude that it is only our inability to detect concealed pathological processes which make us call these disturbances functional, can do nothing but harm. This disease is simply and purely a neurosis, and symptoms apparently arising in the cardio-vascular system are only part of the response of the vegetative system to emotional stresses. Other regions of the body are usually involved in the symptomatology. It is therefore wrong to label this illness with a name referring to prominent symptoms.

The clinical picture is well known. Leading symptoms, as far as the cardio-vascular system is concerned, are palpitations, difficulty in breathing, pain in the chest and fatigue. Any one of these singly or in combination, or in conjunction with other functional symptoms, such as frequency of micturition, dyspepsia and headache, may be the presenting complaints.

Palpitations.

Chambers's "Twentieth Century Dictionary" defines palpitations as irregular action of the heart, caused by excitement, excessive exertion or disease. Among medical authors, Pullen (1944) mentions palpitations as synonymous with throbbing. Hutchison and Hunter (1950) and Wood (1956) do not define the symptom. To the patient it is the consciousness of the heart beating. Wolf and Wolff (1956) call it a sensation, usually painless, experienced in the chest or over the heart or its adjacent tissues. These authors state that it can be associated with (i) increased stroke volume, (ii) displacement of the heart or tissues around it, so that tissues ordinarily not stimulated by the heart are in a position to be stimulated, (iii) occurrence of a beat out of phase with preceding or successive beats, or (iv) rapid beating of the heart.

Though this is all correct, it is imperative to realize that these are not the only factors. Patients with organic heart diseases often present all these features, yet do not necessarily become conscious of them; it requires something else to make them felt. As the threshold for perception for sensory stimuli is not decreased (Cohen and White, 1951), it can be only the association of these sensations with strong emotional disturbances which facilitates the undue perception of normal physiological processes. This is due to previous experiences which, by their magnitude and repetition, have conditioned the patient to increased perception. Acute and powerful external stimuli will overpower the usual sensations, and palpitations may not be felt in periods of crisis. Under ordinary circumstances, a person may feel palpitations while lying in bed recalling difficult life situations; yet these symptoms may not be noticed at work or some other diversion.

I want to stress that we have to pay some attention to what the patient means by palpitations. It is wrong to think that his definition is always the same as ours. The acceptance of a patient's statement that he suffers from palpitations as evidence in favour of organic heart disease without other corroborative findings is inexcusable.

Wood (1941) refers to tachycardia only as the cause of the sensation of palpitations in patients with anxiety states. I have examined many patients during the time when they were conscious of their palpitations; often their heart rate was quite within the normal range of 70 to 80 beats per minute. A bigger stroke volume could be the explanation for their sensation; in other cases, extrasystoles were the apparent cause. The characteristic feature is that this symptom, whatever its mechanism may be in the individual patient, occurs with or without exertion, with excitement and also without any immediate external emotional stimulation. At times no apparent cause can be found on superficial inquiry, and only expert questioning will elicit important associations with some minor acute external event. Many cannot lie on their left side; the altered relationship of their heart to the chest wall and other structures is the cause of their unpleasant symptoms.

We know that stimulation of the posterior hypothalamic nuclei causes extrasystoles (Beattie, Brow and Long, 1930). I have seen patients with prolonged bigeminy following an acute emotional upset. The injection of adrenaline is followed by the appearance of extrasystoles on some occasions in asthmatics and in animal experiments (Scherf and Schott, 1953). It has been shown that strong emotional stimuli can cause paroxysmal auricular tachycardia (Katz, Winton and Megilow, 1947), paroxysmal auricular fibrillation (my own observation) and paroxysmal ventricular tachycardia (Harvey and Levine, 1952).

There remains no doubt that, apart from enhanced appreciation of normal heart action, emotional stimuli can cause, not only undue sinus tachycardia, but also arrhythmias in the whole range from premature systoles to paroxysmal ventricular tachycardia in the structurally normal heart.

Dyspnœa.

Pullen (1944) quotes Meakins as defining dyspnœa as "the consciousness for increased pulmonary ventilation". I do not agree entirely in relation to the subject under

discussion. The patient calls it shortness of breath and means two varieties. The first is an increase in respiratory rate, and the second is the feeling of inability to take a deep breath, as if he could not get enough air into the lungs. Yet this particular type of breathing is associated with deep sighing respiration. It is a feeling of oppression, as if something was stopping the thoracic cage from expanding. I find it a particularly useful symptom in favour of the diagnosis of neurosis, of which it is characteristic. It occurs at any time, has no relation to effort, and is particularly prone to happen in association with recall of fearful and unpleasant situations. It often occurs at night, waking the patient in a panic. True dyspnœa on effort in these patients is characterized by its great variation in degree from day to day, corresponding to the general well feeling of the patient. It is quite different from the dyspnœa associated with heart disease, which varies but little within a short period. It has been shown that there is no abnormality in morphology or in physico-chemical equilibrium which could be the cause of this dyspnœa. The stimulus is entirely emotional.

Chest Pain.

The symptom of chest pain is most easily misinterpreted by doctor and patient alike. The difficulty rests in its differentiation from true anginal pain. Many patients find it difficult to describe the qualities of their pain, others are biased by knowledge of the characteristics of ischæmic heart pain as described to them by sufferers from coronary artery disease. Though anginal pain is usually substernal and chest pain in neurosis precordial or even further to the left, there is no doubt that pain due to ischæmic heart disease does occur in the latter regions. Radiation into the left arm and into the neck is not uncommon in pain without organic disease. In women submammary pain is frequent in anxiety states. More reliable than the site of the pain is its relation to exertion. Emotionally conditioned pain does occur without exertion and without obvious emotional stimuli, though it can occur with these as well. The duration of the pain is more helpful. Patients often refer to a continuous pain lasting hours or days. Rest may relieve it, but often after hours only. One patient told me that he would have to go to bed for the rest of the day to get relief from his pain caused by visiting the doctor in the morning. Relief obtained by the use of glyceryl trinitrate is another helpful criterion; whereas true anginal pain is relieved within a few minutes, patients with functional chest pain often say that it takes 20 minutes or more for the drug to be effective. This is much longer than the useful action lasts, and is apparently due to suggestion.

Yet with all these apparent differences in behaviour of chest pain, the practical difficulties may be considerable. Anginal pain is well known to many from newspapers' medical columns and from description by friends and relations suffering from coronary artery disease. Exercise tolerance tests can be without value, as the results are at times misleading in the probable neurotic; false positive results, though not common, do occur. Often we have to rely on associated features, such as functional dyspnœa and other symptoms of neurosis, apart from history of past or present emotional stresses of sufficient magnitude to distinguish the organic from the nervous.

The mechanism of the precordial and submammary pain has never been satisfactorily explained. It seems to arise in musculo-skeletal tissues, and at times can be relieved by an injection of a local anæsthetic agent if tender areas can be discovered (Wood, 1941). I discussed this question with a physiologist, Professor R. W. Hawker, and he made the following suggestion:

> It may perhaps be likened to tension headaches. Here there is sustained contraction of the temporal or occipital muscles, i.e. muscular spasm, and as a result there is compression of blood vessels within the muscle and hence ischæmia. This causes the release of a pain-producing substance (P.P.S.) which might be lactic acid, potassium, histamine, 5 hydroxy-tryptamine, etc. The P.P.S. stimulates pain endings, so that pain is felt in the muscle; this somatic pain may be even referred as is often the case with visceral pain.

Comment.

Much has been written on the cardiac efficiency in these persons. Many of their symptoms suggest that they could be due to cardiac failure. Exercise tolerance tests, embracing measurements of heart rate, blood pressure, cardiac output and oxygen consumption before and after exercise, have shown that there is no sign of cardiac failure. The only difference from the normal found is that the rise in pulse rate does not quite return to preexercise level within the usual two minutes. This occurs, too, in the emotionally well-balanced person under an acute emotional stress. Great variations have been found, depending on the patient's emotional tension at the time of the test (Wolf and Wolff, 1946). In practice, this is shown by the great differences in capacity of these people for physical effort from day to day, in contrast with those suffering from organic heart disease.

The importance of this clinical picture is that it is still not sufficiently often recognized. Many of these patients are treated for organic heart disease, or, if the condition is correctly diagnosed, they are inadequately managed.

The two basic primitive instincts, self-preservation and preservation of the species, are associated with considerable muscular activity. Under natural and primitive circumstances, self-preservation means fighting or running away. Fight and flight reactions are associated with anxiety, which is composed of fear and physical preparedness. These primitive reactions are represented in the brain in the old and primitive allocortex which, as we have seen, is concerned with emotions and autonomous activities. Physical response to danger requires increased blood supply to the muscular system, dilatation of the muscle arterioles, release of adrenaline, and increase in cardiac output by increase in stroke volume and/or increase in heart rate. This mobilization of energy or tension eventually finds an outlet in action. Recall of these situations will stimulate the same physiological responses (as a conditioned reflex), though they may be less in degree and are not followed by relief in action. Frequent repetitions of these situations without any action conditions the individual to respond to even smaller stimuli, which provoke anxiety responses as do the original stimuli. I have no doubt that most, if not all, patients suffering from anxiety states have gone through prolonged periods of fear without relief in action. An insecure childhood is the most common factor, particularly mother-deprivation, a violent alcoholic father or over-strictness of well-meaning parents. These features are almost always found in the history of these unfortunate persons. Later stresses of ætiological significance are usually prolonged domestic difficulties. I do not think that genetic factors are important. If they play a role at all, they can have a limited influence only, and there is no way of measuring their degree. My conception of the ætiology of these disabilities is, then, conditioning of prolonged anxiety and insecurity as a rule in childhood up to the age of 18 years, resulting in unduly violent emotional reactions to later stresses. These may be everyday stresses of life, recall of difficult life situations, dreams or new severe emotional upsets. The reaction remains the same — stimulation of the autonomic nervous system. If the fear of heart disease is superimposed on this, the threat to life is added and a vicious circle is established.

The clinical importance is the recognition of the true nature of the disability and the attempt to dispel the fear of heart disease by psychotherapy in the first instance; this, as far as the non-psychiatrist is concerned, will have to be limited to explanation and reassurance. If any doctor does not feel competent to manage the patient adequately, it is his duty to refer the patient to somebody who does. This advice has been given on numerous occasions before, but bears repeating

because it is not carried out often enough. How to manage the neurosis in detail is beyond the scope of this paper. A few rules which I find helpful are worth mentioning for those who, like myself, have no special training in psychiatry.

1. Take an adequate history. If this suggests an emotional cause for the symptoms, an attempt will have to be made to find the conditioning causes in the past and the precipitating factors in the present. At times it is wise to postpone this latter part of the history-taking until after the physical examination. Some patients will not talk freely until a thorough examination has not shown any heart disease.

2. Examine the patient thoroughly; do not hesitate to use X-ray examination and electrocardiography. The patients think these are essential for an accurate diagnosis.

3. Be very definite in the statement that there is not heart disease, and do not restrict physical exertion. As many have refrained from exercise for prolonged periods, resumption of such activities will have to be gradual, otherwise symptoms will recur and doubt as to the correctness of the diagnosis will appear in the patient's mind.

4. Do not reexamine the patient for the same symptoms; the patient must realize that you are certain in the diagnosis.

Many will not accept the diagnosis of neurosis readily. Popular conception of the meaning of this word is that it is an imaginary illness often associated with some gainful purpose. If it is explained that the real meaning is the occurrence of physical symptoms as the result of emotional stresses, the guilt feeling is removed and the diagnosis may become acceptable. Patients will understand how acute emotional upsets will cause physical symptoms in any person; they also will realize that it is not possible to imagine a pain.

The difficulties encountered in managing these people can be considerable. The diagnosis of absence of organic heart disease is sometimes very difficult, in spite of modern diagnostic methods, of which electrocardiography and X-ray examination are the only ones generally available. Though in the absence of any demonstrable physical abnormality one is on reasonably certain ground, it may be less easy to be definite if organic, but asymptomatic, heart disease is present. If there is enough evidence in the history to justify the diagnosis of a neurosis, I prefer to be definite in my opinion that this is a nervous disease, rather than give a doubtful diagnosis of probable organic heart disease.

Much thought has been given to the apparent inefficiency of these patients, their inability to maintain physical effort. Standard exercise tolerance tests have been performed (Stevenson, Duncan and Wolff, 1949). The results have shown that "the average cardiac output in emotionally disturbed patients is greater before and after exercise. This is due initially to a greater stroke volume and if the emotional stress is bigger by increased heart rate". These authors conclude that these disturbances apparently result from exaggerated cardiac mobilization in response to symbolic stimuli to action. The same group of investigators (Duncan, Stevenson and Wolff, 1951) also showed that these patients had a greater variety of exercise intolerance than patients with organic heart disease.

Wheeler, White and Cohen (1950), in a follow-up study lasting for 20 years, found that 12% of their patients recovered, 35% had persistent symptoms but no disability, 38% had some mild disability, and only 15% were found in whom the disability was moderate or severe. An important finding in this connexion is that there was no evidence that these patients developed hypertension, heart disease, peptic ulcer, asthma, ulcerative colitis or mental disease in undue numbers. Actually fewer deaths occurred during that period than was statistically expected.

The Influence of Emotional Stresses on Patients with Organic Heart Disease.

Anxiety neurosis occurs also in persons with organic heart disease. As was mentioned earlier, the difficulties are magnified, as one cannot always be quite certain whether the dyspnœa or the chest pain belongs to the one or the other. If there are physical signs of cardiac failure, they temporarily overrule any other consideration, and heart failure will have to be controlled. Once this has been achieved, and if symptoms are still present out of proportion to estimated cardiac function, the possibility of an associated and ætiologically independent anxiety state should be given consideration. The difficulties are particularly great in patients with coronary artery disease. The question of chest pain has already been discussed, and it was pointed out that to distinguish organic from functional pain can be very difficult; how much more so when the presence of organic disease is definite! The obvious answer is that both diseases will have to be treated, though it will be impossible for the patient to ignore the threat of the outcome of his heart disease.

There is no doubt that emotional stresses can influence the function of an abnormal heart. Stimulation of the sympathetic nervous system may put demands on the abnormal heart beyond its functional capacity. Among precipitating causes for the onset of cardiac failure, psychic trauma was apparently responsible in 2% of cases (Sodeman and Burch, 1938). Wolfe (1936) describes the history of a woman, aged 45 years, who was readmitted to hospital at very short intervals with exacerbation of cardiac failure in spite of apparently good control on her discharge and with continued medication. It was then realized that a difficult domestic situation existed, involving sexual relationship and recall of previous unpleasant and frightening experiences in this respect. Intensive psychotherapy was instituted, her exercise tolerance improved remarkably, and hospital admissions were no longer required to keep her cardiac failure controlled. Similar experiences are encountered with regard to a number of our patients who come into hospital with recurrent cardiac failure, in spite of apparently adequate drug therapy. Though it is customary to prescribe a sedative for most patients with cardio-vascular disease, this is frequently quite inadequate treatment for their emotional difficulties, as their severity is often not sufficiently appreciated. We are more conscious of the relationship of emotional upsets and coronary artery disease. It is common knowledge that such upsets precipitate anginal pain; whether they can do more harm deserves investigation.

Popular opinion is very much inclined to blame emotional stresses as the immediate and remote causes of myocardial infarction and sudden death. It is difficult to find much objective evidence for this opinion in the literature. The death of John Hunter is always quoted in this connexion. After all, John Hunter was 65 years of age, no mean feat 200 years ago, and had been suffering from anginal pain for 20 years. Boas (1942) mentions that Phillip V of Spain collapsed and died when he was brought news that his army had been defeated. Autopsy showed a ruptured heart. Boas quotes Martin and Villanova, who describe the case of a man who died suddenly after being held up and robbed. At post-mortem examination coronary artery disease was found. The author describes some of his own cases, in which myocardial infarction was almost immediately preceded by an intense emotional stress. In one case the safety and integrity of the patient himself were involved; in the other, the patient feared for the safety of his son. We have recently read in the newspapers of a man who suddenly died while being transferred into a lifeboat from a disabled and sinking ship. Two veterans died on the morning of Anzac Day while getting ready for the ceremonies. A newspaper photographer suddenly collapsed and died while "covering" a blaze on the Hudson River in New York. These cases are very suggestive. The mechanism of death in these cases is probably a sudden arrhythmia precipitated by release of adrenaline. We know that arrhythmias can occur in

normal hearts under emotional stress, and it is not unreasonable to assume that ventricular fibrillation can be caused in the same way. Relative ischæmia is the probable cause of myocardial infarctions occurring under these circumstances.

I recently attended a woman who had had a myocardial infarction some months before. She was progressing well, and had not had any pain since the initial attack. A very intense emotional upset, involving the relationship of her husband to herself and to his own family, precipitated severe coronary pain, lasting some hours. She required morphine and heavy sedation and some days in bed to recover. She has been well since.

These cases are probably not very common. There is no doubt that in all these patients advanced coronary artery disease is present. It appears that the magnitude of the emotional stress is inversely proportional to the degree of heart disease.

There has been some experimental evidence that mental stresses may be related to anatomical changes in diseased hearts. Schneider and Zangari (1951) found that with anxiety, tension, fear, anger and hostility, the clotting time of the blood was shortened and relative viscosity increased. These authors suggest that this is a protective mechanism to ensure minimal blood loss in combat, but that if it is chronically and inappropriately called into operation it may favour intravascular clotting. Capillary hæmorrhage into an arteriosclerotic plaque as the direct result of an emotional rise in blood pressure has been suggested as another possible result of emotional tension. Myocardial infarction following relative ischæmia caused by too great a demand on cardiac output under emotional stress is yet another possibility. As far as the former is concerned, we do not know whether fluctuations of the blood pressure can be transmitted as far as the capillaries in an arteriosclerotic plaque. The likelihood that an infarction may be due to relative ischæmia cannot be dismissed. This latter could be significant in acute and considerable excitement, such as a threat to life and security, or perhaps a similar threat to a beloved person such as a child.

The Influence of Emotional Stresses on the Genesis of Heart Diseases.

The popular opinion is that a life full of stresses will cause hypertension and arteriosclerotic heart disease. This opinion is just as prevalent among doctors. A short while ago a medical friend consulted me about his health. He had had labile hypertension for many years, and he mentioned that his 40 years of strains and stresses must surely have affected his cardio-vascular system. His resting blood pressure was within the normal range for his age, his heart was normal in every respect and his exercise tolerance was excellent.

The idea that emotional stresses affect the healthy heart was particularly fostered by some statistics showing that death due to coronary artery disease was prevalent among the professional and executive classes. My objection to these statistics is that this disease is far from uncommon among the working classes. If we blame responsibility and sedentary occupation in the one class, what are we going to blame in the others? Obviously, hard work and lack of responsibility. This is quite obviously untenable. The incidence of coronary artery disease in other countries such as Japan is comparatively low. Do their executives worry less? Lee and Schneider (1958) have published a five-year follow-up investigation of a group of white-collar workers in a big New York office. They divided the employees into executives and non-executives, and found that among the executives the incidence of hypertension was no greater and the incidence of myocardial infarction was actually smaller than in the non-executive office worker. In my opinion there is no conclusive evidence that responsibility predisposes to arteriosclerotic heart disease.

Levy, White, Stroud and Hillman (1945), when reviewing the case histories of a large number of American army officers, found that transient tachycardia due to emotional disturbances and other causes not discernible was often the precurser of hypertensive vascular disease. This has been regarded by others (Stevenson, Duncan and Wolff, 1949) as possibly relevant in the development of structural heart disease on the basis of anxiety. Levy *et alii* in their summary disclose that the death rate in this group with transient tachycardias was not significantly higher than in the controls. It is just as possible that this transient tachycardia was not the cause, but an early sign of hypertensive heart disease. Summing up, I have not been able to find unequivocal evidence that prolonged mental stresses can be responsible as an ætiological factor in the development of organic cardio-vascular disease. I do not believe this is likely.

Mental Symptoms as the Result of Heart Disease.

Neurosis.

As I have already discussed the coexistence of neurosis and heart disease in the same patient, some attention is required to the question of how the occurrence of heart disease affects apparently emotionally well-adjusted persons. Connor (1930), among others, mentions that in older children with rheumatic heart diseases and in women with well-compensated mitral stenosis, emotional disturbance is quite a common occurrence. The possible reason is that over-anxious parents and doctors have restricted normal activity unreasonably, and have thus created an anxiety state. I do not think that heart disease has any such direct effect. Today one sees many children with heart disease who do not behave any differently from a normal child, provided no unnecessary restrictions have been imposed on them. The patient with advanced heart disease has reason to worry about his state of health and the eventual outcome; yet it is surprising how well adjusted most of these patients are, and how infrequently they show neurotic traits. Anxiety is particularly prone to occur in coronary artery disease, especially after a myocardial infarction. Because of the possibility of sudden and unexpected death, few other illnesses are so dreaded by the patient. Two factors seem to be important in the development or otherwise of emotional symptoms: first, the emotional make-up of the patient prior to the attack; secondly, the attitude of the medical attendant. One meets patients who were apparently emotionally well-adjusted persons prior to their illness, which was followed by the full-blown picture of a neurosis. Inquiry into their past history often shows that all the basic factors, such as an insecure childhood, were present, but that none of their previously experienced life situations had been a big enough stress to elicit a strong neurotic reaction. It is important to recognize such a tendency early in their illness, and to combat it immediately. As soon as the initial stage of the illness has passed, an optimistic attitude should be developed; there should be frank discussion about the nature of the illness, healing and development of collateral circulation being stressed. Examples can be cited of well-known persons who have carried on for many years with heavy responsibility. Prolonged and undue rest in bed is to be avoided, and early return to work, depending somewhat on the nature of the work, should be encouraged. As a rule one succeeds in the rehabilitation of these patients, but dismal failures occur in spite of the best intentions, particularly in those cases in which insurance is being received, such as compensation for the heart attack. In spite of excellent clinical recovery they may not make any attempt to return to work, though their income from the insurance is much less than their usual pay, and living standards may have to be lowered. It is very difficult to study these patients, as they are continually on their guard lest they lose their compensation.

Psychosis.

Mental symptoms are not infrequent in association with advanced heart failure, particularly in the elderly. Inadequate cerebral circulation due to some degree of forward failure, probably always in conjunction with cerebral arteriosclerosis, is the cause in most of these cases. Difficulties in sleeping, disturbing dreams, even

nightmares, are not uncommon. True psychotic behaviour is met with and is difficult to relieve. Digitalis intoxication, electrolyte imbalance, uræmia and excess sedation are factors which may contribute to the pathogenesis of these symptoms. Minor cerebral thromboses and occasional emboli from mural thrombosis in the left side of the heart may be responsible. Meticulous attention to these factors will often ease the strain on the nursing staff, who have to bear the brunt of these difficulties.

Iatrogenic Heart Disease.

It is stated that some doctors, through ignorance, carelessness or failure to recognize the mental state of the patient, diagnose organic heart disease where no such disease exists, and cause severe disability in these patients, who consequently believe themselves to be suffering from serious heart disease. There is no doubt that this occurs. Of 631 persons referred to a work classification unit for assessment because of the presence of heart disease, 175 had no heart disease at all. Of these, 19 had been previously correctly recognized as suffering from a neurosis, but the patients had not been convinced. The remainder were "discovered" by doctors, about one-half on routine examination; the rest had sought medical advice because of symptoms (Goldwater, Bronstein and Kresley, 1925). Similar statistics have been published by others. Hart (1954) argues that one cannot rely on the patient's statement of what the doctor actually said. Though this may be true in some cases, one cannot ignore prescriptions for digitalis and glyceryl trinitrate as evidence for the doctor's opinion on the nature of the illness. It is of particular interest how the emotionally well-adjusted person reacts to the diagnosis of heart disease on routine examination. Though I have not kept any statistical records, I recall a number of patients requesting examination of their hearts who, when told that I could not find any evidence of heart disease, informed me that they had been told that they had heart disease but did not believe it. Of 25 consecutive patients with iatrogenic heart disease, 23 had been suffering from a long-standing neurosis, and most of them had cardiac symptoms long before a doctor suggested organic heart disease. A few of these had not thought of heart disease prior to examination, but accepted the verdict without doubt. Among these 25 patients, two had chest pain, and upon being told that it was caused by coronary artery disease proceeded to adjust their life accordingly, yet without neurotic symptoms. In both these cases a second opinion was suggested by friends. Examination revealed other causes for the chest pain, and a healthy cardio-vascular system. No further symptoms were experienced after treatment of the ætiological factors of their chest pain. One cannot disagree with Hart (1954) that most sufferers from iatrogenic heart disease are, in fact, suffering from a neurosis long preceding the diagnosis of organic heart disease. The failure of their medical attendant is that he does not recognize the true nature of the illness and consequently cannot carry out correct therapy. Yet there are a number of patients who are made ill by a doctor through misinterpretation of innocent abnormalities and other factors mentioned above. This is a serious mistake, making a cardiac cripple out of a previously healthy person. These cases are not as numerous as some authors suggest, though one must be forever on guard not to make a similar mistake. A recent publication by Wheeler, Williamson and Cohen (1958) illustrates these findings. During a mass chest survey, it was suggested to the patients over the telephone that they might have heart disease when recalling them for further examination. This upset and frightened almost half the number of persons notified. It did not lead to symptoms of heart disease, neurocirculatory asthenia or neurosis in persons previously free from such symptoms; it did, however, aggravate the symptoms in those with anxiety neurosis. A high percentage of those who became upset were young women. The authors point out that this fits in with previously expressed opinion that symptoms and disability of patients with previous heart or nervous disease may become aggravated by a doctor's word, but that there is very little evidence that a doctor's word creates symptoms or disease in individuals who were previously free of symptoms or disease.

Summary.

The various possible relations between emotional stresses and cardiac function have been discussed. Neurosis is a common cause of symptoms referred to the cardio-vascular system. There is no evidence that stresses cause heart disease. Acute and severe emotional upsets may at times precipitate dysfunction in an abnormal heart. Iatrogenic heart disease, though it occurs, is uncommon in the emotionally stable patient.

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HORMONAL MASTOPATHY: A CLINICAL STUDY AND OUTLINE OF TREATMENT.

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AND

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A SERIES of 536 patients with hormonal mastopathy, derived from the breast clinic of the Rachel Forster Hospital for Women and Children and from our own private series, has been studied and followed carefully over a period of eight years.

In 1950 a breast clinic was established at the Rachel Forster Hospital for the specialized observation and follow-up of all patients with diseases of the breast, both malignant and non-malignant. Thanks to the cooperation of the honorary medical staff, nearly all patients presenting at the out-patient department of the hospital with lumps in the breast have been referred to the breast clinic for investigation and treatment.

This series of 536 patients presented with breast abnormality, excluding carcinomata of the breast. The majority of these were in the pre-menopausal age group, and it soon become apparent to us that the human breast, as well as the uterus, was under cyclical hormonal influence, presumably of ovarian origin. In 75% of these cases, in which pain, tenderness, swelling, and nodular areas fluctuating in size were present in the breast, the symptoms were relieved by the onset of menstruation. A quiescent period of 14 to 18 days ensued, but from the eighteenth day of the cycle onwards, discomfort increased, preexisting lumps became larger and more tender and the whole breast became swollen until the onset of the next menstrual period.

All endocrinologists are in agreement that the development of glandular acini in the breast is under the influence of œstrogen. Experimental work with rats and mice has shown that if rodents are subjected to irregular and excessive doses of œstrogen, the acini develop budding in excess of the normal, fibrous tissue tends to form round the glandular elements, and a similar picture to that obtained in fibroadenosis of the human breast develops. If this unnatural stimulus is continued for a longer period, the acini tend to form into cysts surrounded by denser fibrous tissue, and the microscopic picture changes to that of fibrocystic disease with the cystic element predominating. Geschicter (1947) states that the cause of fibroadenosis and fibrocystic disease can be attributed to an actual or a relative excess of œstrogen in the normal menstrual cycle. To explain the term "relative excess of œstrogen" one must bear in mind the normal production of ovarian hormones in the menstrual cycle. Up till the time of ovulation (about the middle of the cycle) œstrogen is in control; after ovulation the luteal hormone or progesterone becomes evident, and prepares the endometrium to receive the fertilized ovum, or to be shed if gestation does not occur. If ovulation is not occurring, luteal hormone will not be produced and "relative excess" of œstrogen becomes evident. If the production of actual œstrogen is in excess, the normal production of progesterone will be insufficient to neutralize the stimulating effect of œstrogen, and the production of progesterone will be relatively low.

With regard to age grouping, it was found that all but two of the 32 patients who had fibroadenomas removed were aged under 30 years. Of patients with fibroadenosis, those under the age of 40 years were in the proportion of 3:1, and in fibrocystic disease, those aged over 40 years outnumbered those aged under 40 by 3:1. This fact suggests that if the hormonal imbalance is of shorter duration fibroadenosis occurs, but if it is prolonged over the age of 40 years, a fibrocystic condition will develop.

We have taken vaginal smears and endometrial biopsy specimens from some of these patients, hoping to prove that the secretion of œstrogen is in excess, but the results so far have been inconclusive. We have neither the facilities nor the laboratory staff to make repeated steroid elimination tests on the urine of these patients, so have been unable to determine by these methods whether the œstrogen excretion level is raised or not. A more promising line of research is being undertaken at present, in conjunction with the N.S.W. State Cancer Council. This is being done by biochemical tests *in vitro* on fresh tissue removed at biopsy. There is a strong suggestion that this tissue is under œstrogen stimulation, but the findings will be published at a later date.

We wish to stress the importance of early treatment of hormonal mastopathy, because of the incidence of carcinoma supervening on the disease. Excluding the 32 fibroadenomas and 10 biopsies performed for masses of recent traumatic origin, there remains a series of 494 cases in which 22 carcinomas developed in association with preexisting mastitis. This gives an incidence of 4·4%, which is 10 times as high as the over-all incidence of carcinoma of the breast (0·4%). Furthermore, all these cases occurred in the pre-menopausal and menopausal age groups, in which the incidence of carcinoma is lower than in the age group of 50 or over. Therefore, it is our contention that hormonal mastopathy should not be lightly passed over; the patient should not be told to go away and forget about the lump in her breast, or be given phenobarbital and aspirin if she is in pain or discomfort. These patients need reassurance and the promise of continued observation and follow-up. When they realize that they are to be watched closely, they will lose a great deal of their apprehension and cooperate in treatment.

Diagnostic Methods.

All patients presenting have a careful history taken, stress being laid on the following points: (i) length of time since the discovery of the lump in the breast; (ii) any alteration in the size of the lump during the menstrual cycle; (iii) length of time for which the patient has been aware of discomfort or soreness; (iv) time relationship of this soreness to the menstrual cycle; (v) history of menstrual irregularity, both in time and in quantity; (vi) number of pregnancies; (vii) duration of each lactation period; (viii) any inflammation or abscess formation at any time during lactation; (ix) state of general health; (x) any operations on breast or any other operations; (xi) date of the last menstrual period and due date of the next.

The patient is first examined several times in different stages of the menstrual cycle—in the post-menstrual week and again in the pre-menstrual week—and any alteration in the size of the breast or variation in the size of the lumps is noted. For follow-up treatment, the patient is usually examined in the pre-menstrual week every two months, this time being extended to three months if progress is being maintained. If, during treatment, any particular lumps do not resolve, but remain of the same size and consistency or increase in size over a period of four months, we recommend that this area be submitted to biopsy. This delay is not practised in cases in which there is any suspicion of malignancy.

All patients are examined first in a sitting position and then lying down. The comparative size of the breasts is noted, together with the level of the nipples, the consistency of any lumps and whether they are discrete or have ill-defined edges, skin attachment or attachment to the chest wall, the presence of glands in the axilla or subclavicular area, and any discharge from the nipple. These facts are all recorded and illustrated on a special chart. Soft-tissue X-ray films according to the method of Leborgne (1953) are taken of indeterminate masses. This, we find, is more satisfactory than transillumination; fibroadenomata show as discrete encapsulated areas, fibroadenosis as breast tissue denser than normal breast tissue, but not as dense as carcinomas. The latter have ill-defined borders, and a tendency for dense striæ or spicules to penetrate into the surrounding tissue, giving a fuzzy or "star-fish" appearance. Lipomas and cysts show as areas less dense

than surrounding breast tissue. We rarely aspirate the contents of cysts—perhaps occasionally in recurrent fibrocystic disease (Schimmelbusch's), when previous excisions have been performed. With experience in palpating thousands of breasts, one becomes relatively expert in picking out a suspicious area—but never infallible.

For bleeding and discharge from the nipple, we took a series of X-ray films of the affected ducts, using 5 to 10 min. of a contrast medium injected into the ducts. On rare occasions we saw a filling defect in a duct, confirmed as a papilloma on excision; but the method is not without risk of retention of foreign material in the duct system, and we did not persist with it.

Treatment.

Treatment consists of support to the breast, reassurance where possible, administration of vitamin B_1 and luteal hormone, biopsy of all suspicious or persistent masses, and careful and continuous follow-up investigation over a period of months or years.

Support.

We find that mastopathy is more prevalent in the badly supported breast. The heavy breast is prone to thickening and fibroadenosis in the axillary tails; the pendulous, sagging breast develops thickening in axillary tails, and also an elliptical thickening in the lower hemisphere; the very small breast is difficult to support with a brassière purchased by size over the counter. We advise the patient to have an individually fitted brassière (with attention to the size of the cup) containing no elastic and with an inch-wide webbing shoulder-strap capable of adjustment, but not by elastic. We advise the patient to wear this at all times when erect and, if the breasts are very sore, also at night.

Vitamin B_1.

Vitamin B_1 is administered in doses of 40 to 60 mg. per day, to encourage the liver to degrade any relative or actual excess œstrogen in the system. In support of our clinical assumption of excess œstrogen, it was found that in eight cases fibrocystic disease occurred after the patient had been taking an œstrogen compound for menopausal symptoms over periods of two to five years. Two younger patients (aged under 30 years) developed fibroadenosis after taking ovarian hormone to increase the size of the breast. Any abnormality in time or excess bleeding with menstrual periods is relieved by the administration of vitamin B_1.

Progesterone (Luteal Hormone).

Progesterone is given to patients who complain of premenstrual soreness, pain or actual swelling of the breasts in the week or 10 days before the menstrual period. Before 1957, this was given as "Proluton-Depot", 65 mg., one intramuscular injection one week before the estimated date of menstruation, or ethisterone 10 mg. per day by mouth from the eighteenth to the twenty-fifth day of the cycle. If it is given after the twenty-fifth day, the onset of menstruation is often delayed. Since February, 1957, by courtesy of Schering A.G., Berlin, who donated a six months' supply of the product for clinical trial, we have used "Primolut-N", a nor-ethisterone, in daily doses of 10 mg. for one week from the eighteenth day of the cycle. This product is stated to be five times a strong as ethisterone. About 100 patients have been treated with "Primolut-N" with encouraging results. Pain and tension are relieved, and in a large proportion of cases, existing lumps and thickenings subside. The patient is examined every two to three months, preferably in the pre-menstrual week. After four months, any persistent lump which has not subsided or has increased in size is submitted to biopsy, particularly if the rest of the breast tissue has returned to normal. After six months' treatment, if the lumps in the breast have subsided, the progesterone is discontinued; but the patient still takes vitamin B_1. We find that quite a number of patients return and ask to recommence the progesterone treatment because they feel more comfortable whilst taking it. It also relieves premenstrual headache and irritability. Only two patients obtained more relief with the intramuscular injection of "Proluton-Depot" than with "Primolut-N".

Analysis of Surgical Treatment.

Fibroadenoma.—All but one of the 34 fibroadenomas were excised; the exception was in a patient who did not attend for operation. The tumours shelled out easily, were encapsulated and were comprised of fibrous tissue. Only two of these patients were aged over 30 years—one was aged 56 and the other 58. The latter had a large, soft tumour, showing on an X-ray film as a rounded area of radiotranslucent tissue with a denser rounded area in the centre; this proved to be a lipoma with a fibroadenoma in the centre.

Fibroadenosis.—Areas of fibroadenosis are never discrete, and it is difficult to decide when one has reached normal tissue at the borders. On microscopic examination, increased development of glandular structures, sometimes hyperplasia of duct epithelium and dense fibrous tissue in surrounding breast tissue are found.

Fibrocystic Disease.—In fibrocystic disease the clinical picture is one of many cysts of varying size embedded in dense fibrous tissue. Many of the cysts contain a bluish secretion, giving rise to the blue-domed cysts described by Schimmelbusch. This disease is more common over the age of 40 years and is often widespread, and there is a marked tendency to recurrence. In all of the 12 cases in which local amputation of the breast, either unilateral or bilateral, was performed, the indication was recurrent fibrocystic disease.

Discharge or Bleeding from the Nipple.—Two patients had a milky discharge from the nipple, persistent since lactation for months or years, and these responded to the administration of stilbœstrol. The remaining 50 in this group had a serous, serosanguineous or frankly blood-stained discharge from one or more nipple ducts. Careful palpation in these cases always revealed a thickened area in the converging duct system beneath the areola, either linear or rounded, and a cystic "feel"; pressure on this area elicited the discharge. These areas were excised, and strangely enough there was no case of duct carcinoma or malignant papilloma in the 50 under review. Many of the patients had dilated ducts and papillomas within the ducts, but none had neoplasm, although many showed evidence of hormonal mastopathy. Cases which clinically aroused suspicion of malignancy (very hard mass adherent to the skin with blood-stained discharge and retraction of the nipple), and in which malignant disease was proved, are not included in these 52 cases.

Simple Mastectomy.—Twelve patients were submitted to local mastectomy, all for recurrent masses in the breasts, and in all cases the histological picture was one of fibrocystic disease.

Injuries.—Ten patients gave a definite history of recent injury, and as the traumatized area had not resolved within a reasonable time, it was excised. In four of these cases fat necrosis was present, and in six recent dense fibrous tissue and old blood clot.

Carcinoma Supervening on Hormonal Mastopathy.

In the over-all series of 536 patients treated, if one excludes the 32 with fibroadenomas and the 10 who had sustained injuries, there is a series of 494 under treatment for hormonal mastopathy. Of these—again excluding those with fibroadenomas and injuries—243 were submitted to surgery. Twenty-two carcinomas in 494 patients gives an incidence of approximately 4·4%; but if one estimates the percentage of the patients submitted to surgery, one arrives at a figure of 9% (Haagensen, 1956). Kaier (1954) found that of 321 patients with proved fibroadenosis or fibrocystic disease, 6·5% developed carcinoma in a follow-up survey of 11 to 17 years. Also, in 378 breasts which he removed for carcinoma, he found evidence of fibroadenosis and cystic disease in 60%.

These figures are high enough to be alarming, especially when one realizes that the majority of these patients are in the pre-menopausal and menopausal age groups. As 40% of all carcinomas of the breast are œstrogen-dependent, can we regard hormonal mastopathy, which we have proved clinically to be due to hormonal imbalance, as a condition with a marked tendency to progress towards carcinoma if inadequately treated? A wide field for research lies open, and this work should be encouraged.

TABLE I.
Analysis of Cases.

Disease.	Number of Cases.	Biopsy.	Non-Surgical Treatment.
Fibroadenoma	32	32	—
Fibroadenosis (proved histologically)	34	30	4
Fibrocystic disease:			
(a) Proved histologically	125	125	—
(b) With discharge or bleeding from nipple	52	50	2
(c) Recurrent and intractable (unilateral or bilateral mastectomy)	12	12	—
Hormonal mastopathy—no surgery to date	249	—	249
Mastopathy due to definite injury	10	10	—
Carcinoma supervening on hormonal mastopathy	22	22	—
Total	536	281	255

Summary.

1. A series of 536 cases of non-malignant mastopathy is analysed.

2. We stress the fact that our observations and treatment are based on clinical findings only.

3. We have formed the impression that hormonal mastopathy is due to an imbalance between œstrogen and progesterone, either an actual excess of œstrogen or an inadequate secretion of progesterone, which would cause a relative excess of œstrogen.

4. We find that fibroadenosis is more common under the age of 40 years, and fibrocystic hyperplasia accounts for the bulk of the patients submitted to surgery.

5. Treatment with vitamin B_1 and progesterone is very effective in fibroadenosis, and is worth using in fibrocystic disease.

6. The incidence of carcinoma supervening on hormonal mastopathy is of great significance—4·4% of all treated patients and 9% of those submitted to biopsy. In addition, these cases occur in the pre-menopausal and menopausal groups. As 40% of all carcinomas are œstrogen-dependent, the suggestion is put forward that relative œstrogen excess in hormonal mastopathy may lead to the development of carcinoma.

7. Hormonal mastopathy should be treated early and vigorously, and a careful follow-up extending over a period of years should be instituted.

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THE INCIDENCE OF LEIOMYOMATA OF THE STOMACH.

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THE statement that leiomyoma of the stomach is a rare condition may be found in almost all textbooks of pathology and surgery, which in turn mirror the conclusions expressed in a not inconsiderable literature on the subject. However, several writers indicate that these lesions are more frequent than is generally realized. Willis (1954) notes that small gastric leiomyomata are seen frequently in routine post-mortem examinations, whilst Rieniets (1930) and Meissner (1944) record an incidence of 16% and 46% respectively. The incidental finding of several gastric leiomyomata at post-mortem examinations performed in the morbid anatomy department of the Royal Melbourne Hospital prompted a more diligent search for similar lesions.

Material and Methods.

The survey was conducted on the stomachs obtained from 109 consecutive post-mortem examinations performed by the author in the morbid anatomy department of the Royal Melbourne Hospital. Nine of these were rejected because a partial gastrectomy had been performed or a gastric carcinoma was present. The remaining 100 specimens were first inspected from the serosal surface. The majority of leiomyomata could be identified in this way. The stomach was then opened along the greater curvature and the mucosal surface inspected. Finally, the stomach was laid on a wooden dissecting board and palpated. Occasionally a nodule could be felt when it was not visible from either surface. Routine paraffin sections were made of all nodules and were stained with hæmatoxylin and eosin, and either hæmatoxylin and van Gieson's stain or Masson's trichrome stain.

The age and sex of the patients, together with the number, site, size, shape and microscopic appearance of the leiomyomata, were recorded. A note was also made of other lesions found in patients with leiomyomata of the stomach.

Results.

Smooth muscle tumours were found in 17% of the stomachs examined. The characteristics of the tumours in each case are set out in Table I.

In general the tumours were small, fusiform, firm, white nodules, best seen from the serosal surface of the stomach, the edge of the lesion frequently showing minute radiations into the surrounding tissue. The nodules were most commonly situated in the circular or longitudinal muscular coats near the cardia, and were composed of varying proportions of collagen and smooth-muscle fibres. Multiple leiomyomata were present in four cases, and two tumours showed degenerative change with calcification.

Eleven of 68 men and six of 32 women showed leiomyomata in the stomach wall. The age range of patients with gastric leiomyomata was 51 to 84 years, compared with a range of 8 to 88 years in patients without these lesions. The average age for both males (71 years) and females (63 years) with leiomyomata was somewhat higher than for males (65 years) and females (60 years) without such tumours.

Other lesions found in subjects with gastric leiomyomata are presented in Table II. Of the 17 subjects with leiomyomata of the stomach, 10 showed evidence of moderate to severe chronic pulmonary disease, mainly pulmonary emphysema and fibrosis; five had hypertensive cardio-vascular disease, four had pyelonephritis and three showed benign hypertrophy of the prostate. Two patients had leiomyomata of both the stomach and the uterus.

TABLE I.
Characteristics of the Leiomyomata.

Case Number.	Sex.	Age. (Years.)	Number of Tumours.	Size in Millimetres.	Shape.	Macroscopic Location.	Microscopic Location.	Pathologi. Changes.
1	M.	59	1	10×10×10	Round.	Mucosal surface, posterior wall 3 cm. from pylorus.	Inner circular coat.	——
2	F.	66	1	10×10×10	Round.	Mucosal surface, 4 cm. from pylorus.	Muscularis mucosæ.	——
3	M.	82	1	7× 6× 6	Oval.	Mucosal surface, lesser curvature 8 cm. from pylorus.	Inner circular coat.	——
4	M.	61	1	6× 3× 3	Fusiform.	Serosal surface, anterior wall 4 cm. from cardia.	Outer longitudinal coat.	——
5	F.	51	1	10× 5× 5	Fusiform.	Serosal surface, greater curvature 5 cm. from cardia.	Inner circular coat.	——
6	M.	84	1	10× 5× 5	Fusiform.	Serosal surface, greater curvature 5 cm. from cardia.	Outer longitudinal coat.	Fibrosis.
7	M.	78	5	Largest 10× 4× 4	Fusiform.	Serosal surface, greater curvature 3 cm. from cardia.	Inner circular coat.	——
8	F.	55	1	5× 2× 2	Fusiform.	Serosal surface, anterior wall 4 cm. from cardia.	Outer longitudinal coat.	——
9	M.	56	1	5× 2× 2	Fusiform.	Serosal surface, posterior wall 7 cm. from cardia.	Outer longutidinal coat.	——
10	M.	53	1	10× 5× 5	Fusiform.	Serosal surface, anterior wall 8 cm. from cardia.	Inner circular coat.	Fibrosis.
11	F.	60	4	8× 4× 4 8× 3× 3 6× 6× 4 4× 3× 2	Fusiform.	Serosal surface, anterior wall *plus* posterior wall 10 cm. from cardia.	Inner circular coat; inner circular coat; inner circular coat; muscularis mucosæ.	Fibrosis.
12	F.	73	1	5× 4× 4	Oval.	Serosal surface, anterior wall 4 cm. from cardia.	Inner circular coat.	Fibrosis.
13	M.	71	3	6× 3× 3 6× 2× 2 4× 2× 2	Fusiform.	Serosal surface, anterior wall—one 4 cm. from cardia, others 7 cm. from cardia.	Outer longitudinal coat.	Fibrosis.
14	M.	80	1	20×10×10	Fusiform.	Serosal surface, anterior wall 6 cm. from cardia.	Outer longitudinal coat.	Fibrosis and calcification.
15	M.	76	1	7× 3× 3	Fusiform.	Serosal surface, anterior wall 4 cm. from cardia.	Outer longitudinal coat.	——
16	M.	77	1	4× 2× 2	Fusiform.	Serosal surface, greater curvature 3 cm. from cardia.	Outer longitudinal coat.	——
17	F.	72	3	3× 2× 2	Oval.	Serosal surface, posterior wall 9 cm. from cardia.	Muscularis mucosæ.	Calcification.

Discussion.

This series confirms the finding of the American authors Rieniets (1930) and Meissner (1944), that leiomyoma is by far the commonest tumour of the stomach. In view of the widely-held opinion (Antonie, 1953; Pack and Ariel, 1958; Shackelford, 1955) that leiomyoma of the stomach is not uncommonly subject to malignant change, it is important to stress the frequency of the benign lesion. The other features of the leiomyomata seen in this series accord with those described by other writers (Steen and Newell, 1953; Leigh, 1950; Ball, 1945; Palmer, 1951; Golden and Stout, 1941; Jackson, 1953; Antonie, 1953; and Cowdell, 1950). Two excellent surveys are those of Golden and Stout (1941) and of Palmer (1951), while a number of cases seen in Melbourne are reviewed by Jackson (1953) and Antonie (1953).

TABLE II.
Associated Conditions.

Case Number.	Associated Conditions.
1	Emphysema, healed pulmonary tuberculosis, pyonephrosis, hypertensive cardio-vascular disease.
2	Mild emphysema, cirrhosis, ascites, general peritonitis.
3	Emphysema, nephrosclerosis, bronchopneumonia, prostatomegaly, hypertensive cardio-vascular disease, cerebral thrombosis.
4	Pulmonary emphysema, chronic pneumonia, right ventricular failure.
5	Pyelonephritis, hypertensive cardio-vascular disease, pulmonary emphysema.
6	General arteriosclerosis, emphysema, nephrosclerosis, papilloma of rectum.
7	Pulmonary fibrosis, pulmonary emphysema, benign prostatomegaly, hypertensive cardio-vascular disease, gastric ulcer, adrenal cortical hyperplasia.
8	Cerebral aneurysm, subarachnoid haemorrhage, leiomyoma of uterus.
9	Pulmonary emphysema, bronchopneumonia myocardial infarction.
10	Carcinoma of lung, bronchopneumonia.
11	Aortic stenosis, congestive cardiac failure.
12	Myocardial infarction, nephrosclerosis, leiomyoma and adenomyosis of uterus.
13	Pulmonary emphysema, hypertensive cardio-vascular disease, bronchopneumonia, nephrosclerosis.
14	Pulmonary emphysema and fibrosis, bronchopneumonia.
15	Benign prostatomegaly, pyelonephritis, pulmonary infarcts, bronchopneumonia.
16	Pulmonary emphysema, fibrocaseous tuberculosis, bronchopneumonia.
17	Diabetes, myocardial infarction, pyelonephritis, old rheumatic endocarditis.

One feature not touched on by the above-mentioned writers is the association between gastric leiomyomata and other diseases. The frequency of moderate to severe chronic pulmonary disease in association with gastric leiomyomata (10 of the 17 cases) is interesting, in view of the much lower incidence in the patients without gastric leiomyomata (16 of 83 cases). However, the present series is too small to justify any definite conclusions as to a significant relationship between the two conditions. There did not appear to be an association between gastric leiomyomata and any other pathological condition seen in the series.

Summary.

Twenty-eight leiomyomata of the stomach were found in 17 of 100 routine post-mortem examinations. It is concluded that leiomyoma is the commonest tumour of the stomach. In this small series, there appeared to be some association between the incidence of chronic pulmonary disease and that of gastric leiomyomata.

Acknowledgements.

I should like to thank Mrs. M. Pertinac and Miss A. Margetts for their willing assistance in the preparation of sections.

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THE PRODUCTION AND ASSAY OF STONE-FISH ANTIVENENE.

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SINCE the pioneering studies of Sewell, Phisalix and Bertrand, Calmette and others, the immunization of animals against the venom of snakes has become adopted as a standard procedure for the production of snake antivenene. The effectiveness of specific serotherapy has provided a stimulus to the production of antivenene against other animal venoms. After the successful production of red-back spider antivenene (Wiener, 1956), an attempt was made to produce an antivenene against the venom of the stone-fish. The sting of this fish has been responsible for a number of fatalities and severe injuries in tropical waters of the Indo-Pacific regions (Bottard, 1889).

In a search through the literature, it was found that Briot in 1902 reported that rabbits which had received two subcutaneous injections of the venom of the weever-fish did not die when subsequently injected with two lethal doses of venom by the intravenous route. Animals which had been actively immunized were also protected against the local necrotic action of weever-fish venom. Briot further showed that a rabbit which had received 2 ml. of immune serum by the intravenous route tolerated, without ill-effects, a subsequent intravenous injection of two lethal doses of venom.

Since then no further attempts appear to have been made to produce antivenene against fish venom for use in therapy. In fact, only two other references are to be found in the literature concerning immunity against fish venom.

The first can be inferred from a case reported by Cleland (1924) of repeated cat-fish stings in an individual in whom subsequent stings produced less severe symptoms than those which were experienced after the first sting. Although the author did not suggest it, the possibility that the patient had acquired an active immunity against the venom of the cat-fish cannot be excluded. The second reference to active immunity against fish venom appeared when Duhig and Jones (1928) reported the results of their studies on the toxicity of stone-fish venom. These authors observed that a second injection of stone-fish venom into a guinea-pig produced no symptoms, and suggested that an active immunity had been acquired after the first injection of venom.

As a result of investigations reported previously (Wiener, 1959), it became possible to obtain venom from the dorsal spines of the stone-fish (*Synanceja trachynis*), and to determine the toxicity of stone-fish venom in the mouse and rabbit.

The present paper describes a method for producing stone-fish antivenene suitable for therapeutic use and its assay in laboratory animals.

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Preliminary Studies in Mice and Rabbits.

It has been observed previously that stone-fish venom was most stable at pH 7 to 7·6, and that at pH 5 or lower its toxicity was destroyed (Wiener, 1959). In order to determine if stone-fish venom was antigenic and whether or not antigenicity was lost in acid solutions, the following experiment was carried out. Two groups of mice, each containing six animals, were injected weekly with increasing amounts of stone-fish venom buffered at pH 5 and pH 7·4 respectively, over a period of six weeks. Injections were made subcutaneously, the initial dose being 0·02 mg. of venom and the final dose 0·08 mg. of venom.

Five days after the last injection, the mice were challenged by an intravenous injection of two certainly lethal doses of venom. All the animals which had been immunized with venom buffered at pH 7·4 survived the injection, whilst all those injected with stone-fish venom buffered at pH 5 died within 10 minutes after the challenge dose of venom.

It was thus established that an active immunity against stone-fish venom could be produced by injecting venom of pH 7·4, but that at pH 5 the antigenicity of the venom had been either reduced or lost completely.

In view of the limited supply of venom available at the beginning of our investigations, further tests were also carried out to determine if stone-fish venom could be adsorbed on aluminium phosphate, thereby enhancing its antigenicity. The result of these tests showed that in 1 ml. of a solution at pH 7·4, which contained 1 mg. of stone-fish venom and 10 mg. of aluminium phosphate suspension, about 70% of venom originally in solution had become adsorbed on aluminium phosphate after two hours at room temperature.

Several rabbits were then injected subcutaneously with increasing amounts of stone-fish venom adsorbed on aluminium phosphate. Although venom adsorbed on aluminium phosphate was found to be less toxic than a similar dose of venom in solution, the initial dose had to be small to avoid intoxication of the animal. One rabbit weighing 3 kg. received as its first injection 3 mg. of venom. This resulted in local necrosis of the skin; the animal lost weight and died on the sixth day after the injection. The first dose injected into other rabbits consisted of 0·1 to 0·2 mg. of venom; this was increased every 7 to 14 days until 4 to 5 mg. were tolerated without ill effects. In nearly all the animals precipitins and neutralizing antibodies were detectable after the second or third injection.

The course of injections and the level of circulating antivenene in the case of one rabbit (D4) are shown in Table I.

TABLE I.
Immunization of Rabbit (D4) with Stone-Fish Venom Adsorbed on Aluminium Phosphate.

Date Injected or Bled (1958).	Amount of Venom Injected. (Mg.)	Amount of Stone-Fish Venom Neutralized by 1 ml. of Serum. (Mg.)
July 10	0·15	—
July 16	0·7	—
July 28	—	0·15
July 29	1·5	—
August 6	3·0	—
August 14	4·0	—
August 21	—	0·40

Antivenene Production in the Horse.

Having established that stone-fish venom was antigenic in both mice and rabbits, and that neutralizing antibodies could be produced, it was decided to immunize a larger animal against stone-fish venom, with the view to obtaining antivenene of sufficient potency for therapeutic use.

For this purpose a horse which, from previous experience, was known to be a good antibody producer was selected. Stone-fish venom adsorbed on aluminium phosphate was injected subcutaneously over a period, in the amounts shown in Table II. Each dose was prepared

TABLE II.

Immunization of Horse (B575) with Stone-Fish Venom.

Date Injected and/or Bled (1958).	Amount of Venom Injected. (Mg.)	Amount of Stone-Fish Venom Neutralized by 1 ml. of Serum. (Mg.)
August 7	0·5	Not tested
August 14	1·3	Not tested
August 21	4·2	Not tested
August 28	10·0	0·03
September 4[1] ..	25·0	0·15
September 11[1] ..	—	0·90
September 12[2] } ..	—	0·95
September 15[1] }		

[1] Test bleeding.

[2] Six litres of blood collected.

on the day of injection by dissolving the required amount of dried stone-fish venom in normal saline solution buffered at pH 7·4, and adding sufficient aluminium phosphate suspension to render the solution turbid.

The horse tolerated the injections of stone-fish venom without ill-effects, and there was no necrosis of the skin at the site of injection. Samples of blood were tested for antivenene content one week after the third injection and one week after the fourth and fifth injections; 7·9 litres of plasma were then collected by bleeding the animal on two consecutive occasions. The antivenene was refined and concentrated by peptic digestion, dialysis and ultrafiltration, which are the standard methods used at these laboratories for the processing of immune horse sera. However, in this case a special effort was made to concentrate the serum as much as possible. By this means the antivenene titre was increased more than sixteen times (Table III).

TABLE III.

Volume, Solid Contents and Potency of Stone-Fish Antivenene Prepared in the Horse Before and After Processing.

Stage of Process.	Total Volume. (Ml.)	Total Protein Content.	Total Solid Content.	Amount of Stone-Fish Venom Neutralized by 1 ml. (Mg.)
Before processing	7900	7·6%	8·8%	0·9
After refining and concentration ..	250	17·3%	24·7%	16·0

For the preparation of the final product, the antivenene was diluted to reduce the total solid content and sealed in ampoules in 2 ml. quantities, with the addition of a 0·3% solution of tricresol as an antiseptic.

Assay of Antivenene in Mice.

Stone-fish antivenene was assayed by a method similar to that described previously for the determination of red-back spider antivenene (Wiener, 1956).

To varying dilutions of the serum to be tested, a constant amount of stone-fish venom was added. The amount of venom in each mixture represented 7 to 10 LD_{50} doses. Normal saline solution, buffered at pH 7·4, was added to bring the dose-volume to 1 ml. The mixtures were allowed to stand for 30 minutes at room temperature, and then injected by the intravenous route into mice weighing 15 to 20 grammes.

Death or survival of the animals was used as the criterion of venom neutralization. When neutralization was complete, the animals showed no adverse effects. When neutralization was not complete, the animals died either immediately or within a few hours after the injection. In those cases in which less than one lethal dose of venom remained free, the animals appeared sick for a period of 30 to 60 minutes and then recovered. There were no delayed deaths, and results were available on the same day on which an assay was performed.

Table IV shows the results of one assay, which was

TABLE IV.

Assay of Native Horse Antivenene in Mice by the Intravenous Route.

Amount of Serum. (Ml.)	Amount of Venom (1 mg./ml.) in Millilitres.	Amount of Buffered Saline Solution. (Ml.)	Number of Mice.	Number that Died.
0·10	0·2	0·70	2	2
0·12	0·2	0·68	2	2
0·14	0·2	0·66	2	2
0·16	0·2	0·64	2	2
0·18	0·2	0·62	2	0
0·20	0·2	0·60	2	0
0·24	0·2	0·56	2	0

carried out with the pooled horse serum prior to its purification and concentration. The toxicity of the venom used for this assay was also determined under indentical conditions as those used for the assay of the serum.

An assay of the toxicity of venom was carried out each time a determination of the titre of stone-fish antivenene was made. This was necessary on account of the instability of stone-fish venom in solution (Wiener, 1959), and also because it was found that when injected in a dose volume of 1 ml., the toxicity of stone-fish venom was two to three times lower than when the same amount of venom was injected in a dose volume of 0·2 ml. Sergent (1936) has similarly oberved that the toxicity of scorpion venom was reduced when diluted with normal saline solution before injection.

From Tables IV and V it can be calculated that 1 ml.

TABLE V.

Assay of Toxicity of Stone-Fish Venom in Mice by the Intravenous Route.

Amount of Venom (0·1 mg./ml.) in Millilitres.	Amount of Buffered Saline Solution. (Ml.)	Number of Mice.	Number that Died.
0·10	0·90	5	0
0·15	0·85	5	0
0·20	0·80	5	0
0·25	0·75	5	2
0·30	0·70	5	4
0·35	0·65	5	5
0·40	0·60	5	5

of serum neutralized 0·95 mg. of venom, the LD_{50} dose of the venom used for this determination being 0·03 mg. By the same methods of assay, it was found that after the serum was refined and concentrated its antivenene titre had become increased so that 1 ml. neutralized 16 mg. of venom. After this serum was diluted with normal saline to prepare the final product, 1 ml. neutralized 10 mg. of venom.

Assay of Antivenene in the Rabbit.

The ischæmic action of stone-fish antivenene, after intradermal injection in the rabbit (Wiener, 1959), could be utilized for estimating the titre of stone-fish antivenene in a sample of serum.

For this purpose, different dilutions of serum were mixed with a constant amount of venom, and 0·1 ml. of each mixture was injected intradermally into a rabbit. The amount of venom constituted 30 to 60 minimum skin ischæmic doses. When neutralization of the venom was not complete, an area of ischæmia developed within a few hours after the injection and became maximal 24 hours later. Where the diameter of the area of ischæmia exceeded 8 mm., necrosis of the skin at the site of injection also occurred subsequently. Neither ischæmia nor necrosis developed when complete neutralization of venom had occurred.

Results were recorded 24 hours after the injections by measuring two maximal diameters of the area of necrosis at right angles to each other and taking the arithmetic mean. Table VI shows that for one batch of venom the minimum skin ischæmic dose was 0·0015 mg. to 0·003 mg. of venom. When 0·1 mg. of this venom was mixed with different dilutions of refined and concentrated antivenene and then injected intradermally in a dose-volume of 0·1 ml., the results shown in Table VII were obtained.

TABLE VI.

Determination of the Minimum Skin Ischæmic Dose of Stone-Fish Venom in the Rabbit.

Amount of Venom in a Dose-Volume of 0·1 ml. (Mg.)	Mean Diameter of Area of Ischæmia. (Mm.)
0·0500	18
0·0250	17
0·0120	13
0·0060	10
0·0030	6
0·0015	2
0·0008	0
0·0004	0

From these results it can be calculated that 1 ml. of refined and concentrated antivenene neutralized about 20 mg. of venom. As mentioned previously, by titrating the same antivenene in mice it was found that 1 ml. of serum neutralized 16 mg. of venom. The difference in results obtained by the two methods of assay were within the limits of the experimental error expected in this type of assay.

TABLE VII.

Intradermal Assay of Refined and Concentrated Horse Antivenene in the Rabbit.

Amount of Serum. (Ml.)	Amount of Venom. (Mg.)	Mean Diameter of Area of Ischæmia. (Mm.)
0·0200	0·1	0
0·0100	0·1	0
0·0050	0·1	0
0·0025	0·1	13
0·0012	0·1	14
0·0006	0·1	15
0·0003	0·1	18
0·0200	—	0

Protective Action an Antivenene in Vivo.

Several experiments were also carried out to demonstrate the protective effect of antivenene *in vivo*. For this purpose the final product, of which 1 ml. neutralized 10 mg. of venom, was used.

A series of mice were injected intraperitoneally with 0·2 mg. of venom. At varying periods of time afterwards, 0·1 ml. of antivenene was injected by the intravenous route. The animals survived, provided antivenene was injected not later than two hours after the injection of venom. Control mice which did not receive antivenene died in 130 to 140 minutes.

Because of the rapidity with which stone-fish venom kills mice when lethal amounts of venom are injected intravenously, it was not possible to demonstrate experimentally the protective effect of antivenene after an intravenous injection of venom. However, when antivenene was injected intravenously before an intravenous

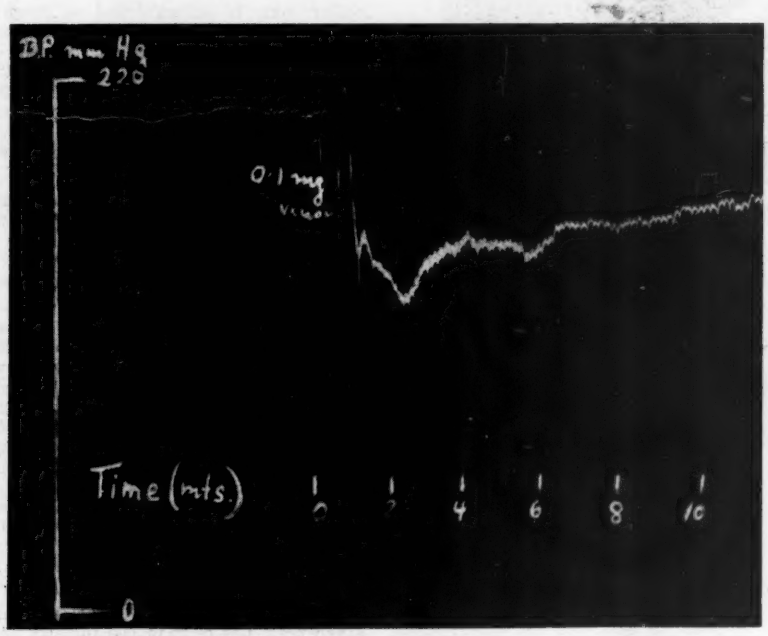

FIGURE I.

The effect of stone-fish venom on the blood pressure of the fowl.

injection of venom, it was possible to measure its protective effect. Thus, in one experiment it was found that 0·1 ml. of antivenene protected against 0·25 mg., but not against 0·3 mg., of venom. On this basis 1 ml. of antivenene protected against 2·5 mg. of venom. This indicates that, in order to neutralize a given amount of venom *in vivo*, four times more antivenene was required than when neutralization occurred *in vitro*.

When a mixture of stone-fish venom and antivenene was injected into a fowl, the prolonged hypotensive action of venom (Figure I) was abolished, and a slight rise in blood pressure occurred instead (Figure II).

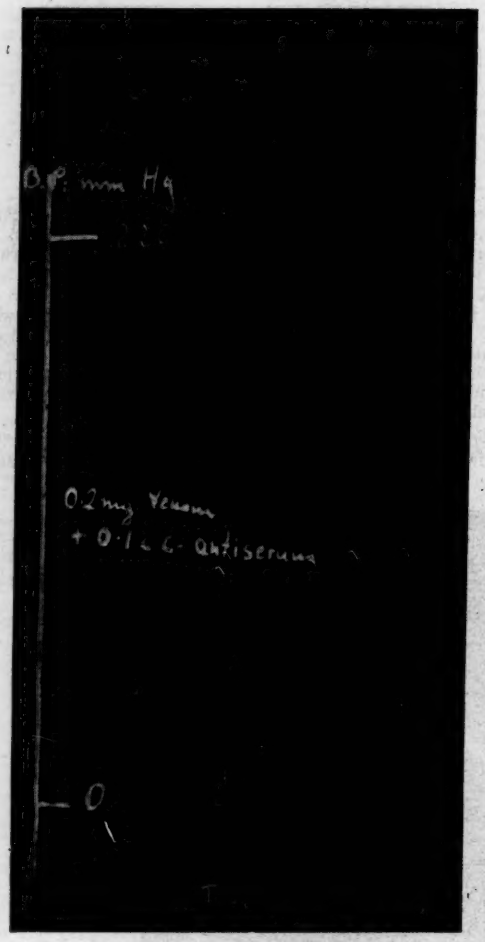

FIGURE II.
The effect of stone-fish venom and antivenene on the blood pressure of the fowl.

Discussion.

It is evident that stone-fish antivenene neutralized all the observable toxic effects of stone-fish venom in animals. Clinical trials are required to establish its effectiveness in man. It will be of particular interest to observe whether or not the severe pain which is a feature of stone-fish stings in man can be relieved by the parenteral administration of antivenene.

In view of the excellent therapeutic results obtained by infiltrating the site of stone-fish stings with a solution of emetine hydrochloride or potassium permanganate (Wiener, 1958), the indications for the use of antivenene may be questioned. The risk of sensitizing a patient to horse serum or of anaphylactic shock in a patient already sensitive, demands that a conservative attitude be taken whenever an injection of antivenene is contemplated.

Clinical experience and the results of animal experiments indicate that stone-fish venom, in addition to its local action, also exerts a central action which may endanger life. Once stone-fish venom has become absorbed into the circulation, its toxic effects can be neutralized only by antivenene. The use of stone-fish antivenene should, therefore, be reserved for those cases which have failed to respond to the local injection of emetine or potassium permanganate. Where symptoms suggest that venom in toxic amounts has entered the circulation, the administration of antivenene is also indicated.

The two venom glands of a dorsal spine of the stone-fish contain 5 to 10 mg. of venom (Wiener, 1959). An amount of antivenene which will neutralize 20 mg. of venom may be sufficient as an initial dose. However, if an individual has been stung by more than one spine and if symptoms persist, further doses of antivenene must be given.

It is of interest to speculate whether the different actions of stone-fish venom are due to the presence of more than one toxic fraction. The approximately similar results obtained when antivenene was assayed by the use of the intradermal method in the rabbit and the intravenous route in mice, indicate that the lethal and necrotic effects are the result of the action of one component in stone-fish venom. A parallel exists in the case of diphtheria toxin, which can also be assayed by two different techniques (Jensen, 1933), because its necrotic and lethal effects are due to the same component.

The concept of a single toxic component in stone-fish venom finds further support in observations which showed that heating venom at 50° C. for several minutes destroyed three of its characteristic actions; it was no longer toxic to animals and no longer produced necrosis or hypotension (Wiener, 1959). In addition, when heated venom was allowed to diffuse against antivenene in agar, only one zone of precipitation resulted instead of two. From the incomplete evidence available so far, it is suggested that there are at least two antigenic components in stone-fish venom. One is heat-labile and responsible for a variety of toxic manifestations, whilst the other is relatively heat stable and non-toxic.

The venom used in our investigations was obtained from *S. trachynis*. Two other species of stone-fish have been described, namely, *S. verrucosa* and *S. horrida*. It is not known whether antivenene produced against the venom of *S. trachynis* will neutralize the venom of the other two species.

An antigenic relationship has been shown to exist amongst the venoms of different species of spiders belonging to the genus *Latrodectus*, of which the red-back spider (*L. hasseltii*) is the Australian representative. Antivenene produced against the venom of this spider neutralized the venom of *L. tredecimguttatus* (Bettini, 1957), and *L. tredecimguttatus* antivenene protected animals against the venom of *L. mactans* (Keegan, 1955). Similarly, experiments conducted by the writer in 1957 showed that antivenene produced against *L. indistinctus* neutralized the venom of *L. hasseltii*. However, differences in the toxicity and antigenicity of the venoms of *L. geometricus* and *L. indistinctus* have been observed (Finlayson, 1936).

In the case of snake venoms, there are also marked differences, not only in the toxicity of the venom amongst members of the same genus, but also in the ability of antivenene produced against the venom of one species to neutralize the venom of another (Christensen, 1955). In some cases antivenene produced against the venom of one species provided a broad spectrum of cross-protection by neutralizing the venom of snakes belonging to different genera, whilst in others even the venom of a related species was not neutralized (Grasset, 1936).

The antigenic relationship amongst the venoms of the three species of stone-fish remains to be investigated. The similarity of the clinical picture produced by the sting of any stone-fish suggests that the venoms of the different species have similar actions. Until evidence to the contrary becomes available, it can be assumed that antivenene produced against the venom of *S. trachynis* will neutralize, to some extent, the venom of the other two species of fish.

Summary.

The venom of the stone-fish (*S. trachynis*) was antigenic in the mouse, rabbit and horse. Animals injected with stone-fish venom produced both neutralizing and precipitating antibodies.

A method for producing antivenene in the horse is described. This antivenene was refined and concentrated so that 1 ml. neutralized 16 mg. of venom.

The lethal action of stone-fish venom in mice and its ischæmic effect when injected intradermally into rabbits were utilized for the assay of the potency of antivenene.

Stone-fish antivenene neutralized all the observable toxic effects of stone-fish venom. Mice injected with antivenene were protected against a subsequent injection of lethal amounts of stone-fish venom.

The significance of these findings in relation to the use of stone-fish antivenene in therapy is discussed.

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Addendum.

Since this paper was written, Dr. T. T. Romans, to whom two ampoules of antivenene had been sent for clinical trial, has had occasion to use them in two cases which occurred at Rarotonga (Cook Islands) where stone-fish stings are not uncommon. Dr. Romans informed us that "the results were most promising and encouraging". Both patients received the antivenene about two hours after being stung, together with a small amount of procaine. Twenty-four hours later all pain had disappeared and there was virtually no swelling at the site of the sting, which was quite a contrast to previous cases.

DENGUE IN THE NORTHERN TERRITORY.

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Commonwealth Serum Laboratories, Parkville, Victoria.

ON several occasions since 1920, large numbers of inhabitants of the high rainfall coastal belt of Queensland and northern New South Wales have been affected by dengue fever (McCallum and Dwyer, 1927; Lumley and Taylor, 1943; Rowan, 1957). The high level of neutralizing antibody against dengue-1 virus which Rowan (1957) found in 11 out of 12 patients who were studied during the outbreak of dengue in Townsville in February, 1954, and the demonstration of neutralizing antibody against this virus in sera of flying foxes, bats and wading birds shot in this general area during December, 1954, and December, 1955, provided good evidence that this epidemic was caused by dengue-1 virus. Using Murray Valley encephalitis (M.V.E.) antigen prepared from infected chorio-allantoic membranes, Ludford and Cook (1957) demonstrated a considerable increase in titre of complement-fixing antibody in paired sera from nine patients out of 17 who had dengue in Townsville in February, 1954; but none of these sera contained neutralizing antibody against M.V.E. virus. Similarly in Innisfail, 16 patients out of 72 who had dengue during March, 1954, showed a fourfold or greater increase in titre of complement-fixing antibody to M.V.E. antigen, but none had neutralizing antibody against this virus. Since dengue-1 and M.V.E. viruses are related antigenetically on the basis of complement-fixation tests (McLean, 1956), but distinct when compared in neutralization tests (Smithburn, 1954), Ludford and Cook's (1957) results provide further evidence that dengue-1 virus spread in Innisfail during the 1954 epidemic.

Although dengue fever has occurred in the Northern Territory during the wet seasons of some years, the ætiology of these outbreaks has not been determined hitherto. In searches for possible endemic foci of M.V.E. virus in the Northern Territory, Beech *et alii* (1953) found that three out of 20 healthy Goulburn Island aborigines had M.V.E. complement-fixing antibody and another two had neutralizing antibody, and a higher incidence of M.V.E. antibody was found in other coastal areas. In a further survey between October and December, 1954, Miles and Dane (1956) found that 12 aborigines out of 46 tested at Beswick Downs, in southern Arnhem Land, had M.V.E. complement-fixing antibody, and a total of 39 aboriginal sera neutralized this virus. These sera were not tested for the presence of dengue antibodies.

Following the pattern of previous years, outbreaks of "fever of uncertain origin" occurred amongst residents of Arnhem Land and some offshore islands during the wet season of February and March, 1958. This paper reports serological investigations on paired sera of 12 patients who suffered from illness suggestive of dengue at this time.

During February and March, 1958, many inhabitants of Croker Island and the nearby Goulburn and Bathurst Islands, which are approximately 150 miles north-east of Darwin on the coast of Arnhem Land, became affected by an illness which comprised pyrexia for seven to 10 days, generalized aches and pains, backache, cough and sore throat. Neurological disturbances such as behaviour problems and *petit mal* attacks were encountered in one patient, another patient developed a choreiform ataxia, and a third patient complained of paræsthesiæ of the extremities. On March 6, 1958, similar cases of illness were first noted amongst natives on Oenpelli Mission, which is approximately 150 miles east of Darwin, in Arnhem Land. During March, 14 natives from Goulburn Island arrived at Oenpelli. By March 18, 40 patients at Oenpelli were ill, with temperatures ranging from 99° to 104° F., backache and generalized aches and pains, and mild pharyngitis.

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The illness which affected 40 natives at Oenpelli was considered at the time to be influenza. Accordingly throat washings were obtained from five representative adult patients for attempts at isolation of influenza virus. Otherwise the illnesses showed some features which resembled mild dengue; but severe backache ("break-bone fever") and rash, which are characteristic of dengue (Sabin, 1952), were not encountered.

All patients became ill during the "wet" season, when a total rainfall of some 60 inches was recorded for January, February and March. Rainwater accumulated readily in containers such as old motor-car tyres, broken bottles, tins and sea shells. Domestic rainwater tanks are installed at mission buildings both at Oenpelli and at Croker Island. All these collections of water are favoured breeding sites for mosquitoes, especially *Aëdes ægypti* (L.). This mosquito is distributed widely throughout the Northern Territory.

On March 18, throat washings were obtained from five patients at Oenpelli who had developed fever not more than two days beforehand. These throat washings were immediately transferred to a "Thermos" flask containing ice and salt, in which they were subsequently conveyed by air to the Commonwealth Serum Laboratories, Melbourne, for attempts at isolation of influenza virus. No virus was isolated after amniotic inoculation of 11 day-old chick embryos (Warburton, personal communication).

Serum samples were obtained from 12 patients as soon as possible after the onset of symptoms, and further samples were obtained two to three weeks later. In nine instances, the first serum sample was obtained three days or less after the onset of fever; but in three cases the first serum sample was not obtained until one to two weeks after symptoms had been first noted. All sera were heated at 56° C. for 30 minutes and stored at −20° C. until tested.

Virus seeds were prepared as 10% mouse-brain suspensions in mixture 199 containing 10% inactivated calf serum. Small aliquots were sealed in ampoules and stored at −70° C. in a dry-ice cabinet. M.V.E. virus was in its twenty-first mouse-brain passage. Both the dengue-1 (Hawaiian strain) and dengue-2 (New Guinea C strain) had been through more than 50 mouse-brain passages.

The neutralization test for antibodies to M.V.E. virus by intraperitoneal inoculation of suckling mice aged between four and eight days was performed in the same manner as described previously (McLean and Stevenson, 1954). For detecting antibodies to dengue-1 and dengue-2 viruses, the serum-virus mixtures were inoculated intracerebrally into mice aged between two and four days. In the tests for M.V.E. antibodies, 40 mouse LD_{50} of virus were used, for dengue-1 antibodies 20 or 30 mouse LD_{50}, and for dengue-2 antibodies 60 mouse LD_{50}. All results of antibody determinations were expressed as neutralization indices.

The results of antibody determinations against M.V.E. dengue-1 and dengue-2 viruses are shown in Table I. Antibody to M.V.E. virus was present at similar level in both early and late sera of five patients. All these patients lived at Oenpelli. Of those seven patients who lived at Croker Island, no antibody was detected in serum from five, and serum titres of doubtful significance were obtained from two.

Antibody to dengue-1 virus was detected at similar level in serum pairs from six patients. In three cases a serum sample obtained during the first week of illness contained no antibody, but antibody was detected in serum obtained two to three weeks later. A single specimen of serum obtained from one patient 14 days after the onset of fever contained antibody. Two patients did not have antibody in either early or late sera.

Antibodies to dengue-2 virus were not detected in serum from any of the 12 patients.

The presence of rising antibody levels against dengue-1 virus in the serum of three persons who were affected with an illness showing features reminiscent of dengue, together with the presence of antibody in serum pairs from six other patients in the same epidemic, in which practically all the inhabitants of Croker Island became ill, strongly suggests that dengue-1 virus caused the epidemic. However, in the absence of virus isolations from patients, results based on serological observations alone can do more than point the way to the possible ætiological agent in the epidemic. No attempt was made to isolate virus from the blood of the patients, owing to the lack of dry ice for storage of serum in transit to the laboratory.

Discussion.

Although dengue-1 virus is distinct antigenically from other arthropod-borne viruses on the basis of neutralization tests in which hyperimmune mouse serum is used (Smithburn, 1954), recent experience with serum obtained from 815 residents of Trinidad, British West Indies, where dengue, yellow fever and Ilheus are endemic (Downs *et alii*, 1956) has shown that 22·8% had neutralizing antibody against dengue-1 virus alone; but 3·3% of sera which neutralized this virus also neutralized yellow fever virus, 4·7% of sera neutralized Ilheus virus in addition

TABLE I.

Antibody Levels against Arthropod-Borne Viruses in 12 Northern Territory Residents.

Patient.	Age. (Years.)	Residence.	Date of Onset.	Days after Onset.	Antibody Levels (Neutralization Indices).[1]		
					Dengue-1.	Dengue-2.	M.V.E.
A	—	Croker.	9/2/58	1	0	0	0
				53	20+	0	—
B	—	Croker.	12/2/58	7	30+	0	0
				22	30+	0	0
C	11	Croker.	12/2/58	14	20+	0	3
				29	—	0	3
D	4	Croker.	20/2/58	6	10	0	0
				21	20	0	0
E	8	Croker.	23/2/58	3	0	0	1
				18	0	0	10
F	7	Croker.	4/3/58	13	0	0	0
				27	30+	0	0
G	44	Oenpelli.	16/3/58	2	15	0	20
				15	10	0	20
H	35	Oenpelli.	17/3/58	1	15	0	40+
				14	15	0	40
I	35	Oenpelli.	17/3/58	1	0	0	40
				14	20	0	40+
J	20	Oenpelli.	18/3/58	0	20	0	20
				13	30	0	20
K	33	Oenpelli.	18/3/58	0	30	0	40
				13	30	0	40
L	8	Croker.	24/3/58	2	0	0	0
				16	0	0	—

[1] "0" indicates neutralization index less than 10; "—", not tested.

to dengue-1 virus, and 4·2% of sera neutralized all three viruses. This shows that infection of humans by more than one arthropod-borne virus may broaden the antibody response considerably.

In the Northern Territory, where serological surveys (Beech *et alii*, 1953; Miles and Dane, 1956) have indicated the possibility of endemic foci of M.V.E., results of neutralization tests against dengue-1 virus must be interpreted with caution. Although the proportion of Northern Territory natives with antibody against both dengue-1 and M.V.E. viruses is higher than the proportion of Trinidad residents who had antibody against two or more arthropod-borne viruses — thus suggesting a higher incidence of mixed infections in the Northern Territory — we showed that three persons who had no antibody in acute-phase serum developed dengue-1 antibodies during convalescence. Moreover, one of these three persons did not develop M.V.E. antibodies during convalescence, and in another, who had M.V.E. antibody, the level of this antibody did not change significantly after the illness. Although these results strongly suggest that dengue-1 virus caused this epidemic, effort should be directed strenuously towards isolating virus from the blood of febrile patients and from wild-caught mosquitoes during subsequent outbreaks of disease in the Northern Territory.

Summary.

Acute and convalescent sera obtained from three patients out of 12 who suffered from dengue-like illnesses in the Northern Territory during February and March, 1958, showed rising levels of neutralizing antibody against dengue-1 virus, and seven other patients had elevated antibody levels. These findings strongly suggest recent infection with dengue-1 virus.

Acknowledgements.

We are grateful to the Director-General of Health, Commonwealth Department of Health, for permission to publish this paper. We wish to thank Dr. C. E. Cook for stimulating our interest in this problem. We are grateful to Dr. R. C. Webb, Director of Health, Northern Territory, and the Northern Territory Aerial Medical Service, for collecting the specimens from Oenpelli.

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COMPARISON OF VARIOUS HOSPITAL BLANKETS AFTER REPEATED LAUNDERING.

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THE unsatisfactory nature of the traditional hospital blanket is now generally recognized. For æsthetic and bacteriological reasons it is desirable that blankets should be washed frequently and that the laundering should include a bactericidal treatment. A satisfactory blanket must therefore withstand repeated machine washing and drying, and this treatment is far more likely to damage the blanket than normal usage in the hospital ward.

The blanket most frequently used in Australian hospitals is Type C of S.A.A. Commercial Standard No. 10 (Standards Association of Australia, 1941), which has a woollen weft contributing 70% of the blanket weight, and a cotton warp contributing 30%. In use these blankets become unserviceable either because they shrink seriously due to excessive felting or because they become badly stained. Their relatively unsatisfactory performance led to the present investigations covering laboratory and laundry trials with the object of finding a more serviceable blanket.

Textile Shrinkage.

Textiles are usually sold to specified dimensions, which are attained by the material being pulled to shape during the final drying operation. This leaves the fabric under strain, which relaxes when the material is wet, typically during the first few washes. This relaxation shrinkage is common to all textiles irrespective of the fibre used, and varies in amount very considerably between different manufacturers.

Because of the surface structure of overlapping scales, individual wool fibres move in one direction more easily than in the reverse direction. This directional frictional effect is the cause of the well-known felting shrinkage of wool fabrics, which occurs during laundering. The reduction of felting shrinkage does not present any difficulty, since a variety of shrink-resistant finishing treatments are available to the wool-textile manufacturer and are, in fact, in commercial use. The oldest and still the most commonly used of these is wet chlorination, first introduced by Mercer in 1839 (Moncrieff, 1953). The possibility of careless application of this method resulting in serious damage to the wool has stimulated a search for safer processes. At least six have been developed in recent years and are economically possible.

Where textile structures lack maximum compactness, the spaces between the threads can close up and cause a third type of fabric shrinkage. This consolidation shrinkage may permit appreciable shrinkage, even in fabrics which have been given a shrink-resistant finish. Excessive compactness gives an unacceptable stiff cloth.

In reporting the results of shrinkage tests, it is customary to list separately relaxation shrinkage and the combined felting and consolidation shrinkage.

Effect of Fibre Blending.

Fibres of different chemical composition have different affinities for stains, such as those encountered in hospitals, and vary in their reaction to bleaching agents. Hence fabrics made from blends of two or more different textile fibres are normally easier to stain and more difficult to clean than those made from a single type of fibre. This is one serious disadvantage of the cotton-warp, wool-weft blanket. Moreover, contrary to popular belief, the addition of a small proportion of cotton to wool does not reduce the felting shrinkage.

Abrasion Properties of Blankets.

The abrasion resistance of all-wool and of wool/cotton blankets was tested with a "Martindale" machine. The

results (average of four tests), expressed as loss of weight in milligrammes per 1000 rubs, are given below:

All-wool 15·8

Wool/cotton 24·7

These results suggest that better wear could be expected from all-wool blankets than from wool/cotton mixture.

Similar results were obtained in a machine designed and constructed in this laboratory, which repeatedly flexed and rubbed together the two halves of a folded 6 in. blanket square. After it was rubbed for one hour at 100 cycles per minute, the weight in milligrammes of fluff shed (average of three tests) was:

All-wool 38·9

Wool/cotton 70·3

These two methods confirmed the opinion that all-wool blankets should be more satisfactory during hospital use than the wool-cotton blend variety.

Laundry Trials.

Materials.

Ten different types of blanket were tested. These are listed below; the abbreviated titles to which reference is made in the text are used, followed by a figure in parentheses indicating the number of blankets of each type that were tested, and by a brief description of each type of blanket. (i) Cotton (2)—blankets woven from cotton yarn and "raised" in the finishing process to give a fluffy surface. (ii) Terry towelling (2)—cotton blankets made on a terry-towelling loom. (iii) "Terylene" (4)—raised blankets made from spun "Terylene" yarn. (iv) "Terylene"/viscose (2)—raised blankets made with "Terylene" warp and viscose weft. (v) Wool/cotton (3)—the normal Australian hospital blanket with cotton warp and woollen weft. (vi) Wool/cotton, "Drisol" (1)—as (v), but treated by the "Drisol" (sulphuryl chloride) process to confer shrink-resistance. (vii) Wool (5)—normal, raised wool blankets. (viii) Wool, "SI-RO-FIX" (2)—as (vii), but given the "SI-RO-FIX" shrink-resistant finish involving resin impregnation (Delmenico *et alii*, 1954). (ix) Wool, oxidized (7)—as (vii), but given a shrink-resistant treatment involving protective oxidation (McPhee, 1958). (x) Wool, chlorinated (6)—as (vii), but wet chlorinated to confer shrink-resistance.

Methods.

After an initial measurement, all blankets were water-sprayed and air-dried overnight in an endeavour to remove relaxation shrinkage. This was unsuccessful. Later measurements showed that most relaxation shrinkage took place subsequently during the first and second washing cycles. All blankets were washed repeatedly in a hospital laundry.

The cotton and synthetic fibre blankets were laundered by the method normally used for soiled cotton, that is, by an initial cold wash in metasilicate solution followed, after a rinse, by a high temperature wash in soap solution, and by three rinses. With the use of a two-speed washing machine operated at the lower speed, wool blankets were washed and after-treated with a quaternary ammonium compound by a method essentially the same as that recommended by Blowers and Wallace (1955). At the time the tests began, this was the most generally accepted method for disinfecting wool. All the blankets were tumble-dried after the usual hydro-extraction.

Every blanket was measured after each of the first ten washes and frequently thereafter. Each blanket was critically examined at intervals.

Results.

The average shrinkage of the blankets to the tenth wash is shown on an area basis in Figure I. Shrinkage prior to the first wash was due to the initial water spraying. The relaxation shrinkage, represented by the sudden initial reduction in area of nearly all the blankets, and the felting shrinkage, shown by the continued decrease in area of the wool and wool/cotton blankets, can be clearly differentiated in this figure. Shrinkage during subsequent washes was unimportant in all but the untreated wool and wool/cotton blankets, which continued to lose area until rejected. It is apparent that all the shrink-resistant finishes tested gave adequate protection against felting shrinkage.

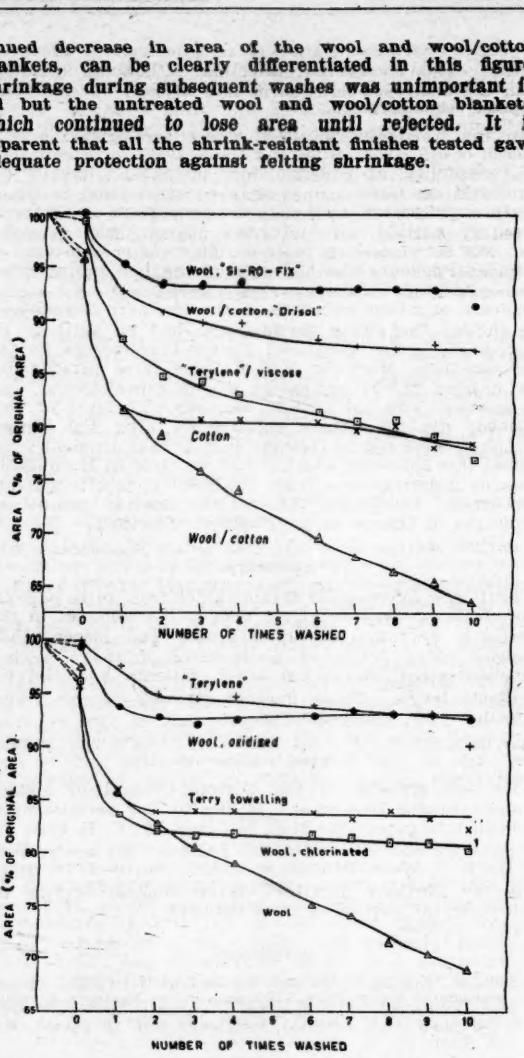

FIGURE I.

Extreme uniformity of behaviour was observed among replicate blankets of the same type, and therefore, after ten washing cycles, the number under test was reduced to two of each type. After 64 washing cycles, three varieties of blanket were classed as unserviceable and were withdrawn. These were the "Terylene"/viscose, where the rayon had failed mechanically resulting in large tears, and the untreated wool and wool/cotton blankets, which had shrunk excessively. Later the "Terylene" blanket was rejected, largely because the static charge acquired during handling was very objectionable and unacceptable to local hospital authorities, and likewise the raised cotton, which rapidly lost its nap. The terry towelling was retained in the experiment, and also the various types of shrink-resistant wool blankets. So far these remaining blankets have received over two hundred washing cycles, and all are still of serviceable size and texture, although now wearing rather thin. It is apparent that blankets of both varieties will give a long and useful life, and that eventual failure will be due to wear and not felting.

The blankets washed in non-ionic detergent and after-treated with a quaternary ammonium compound, particularly those given a shrink-resistant treatment by a chlorination method, slowly discoloured to a serious

degree. Tests suggested that the cause was iron compounds and other insoluble impurities in the water supply; the colour was much better with detergents such as soap, which possess greater suspending power. The possibility of the detergency of the non-ionic compounds being improved by the addition of "builders" such as carboxymethylcellulose was not investigated, as methods of sterilizing wool by boiling were being tested and proved preferable to quaternary ammonium compounds. Details of the investigations of the boiling method will be reported in a separate paper.

Conclusions.

Laboratory and laundry tests of a wide variety of blankets suggest that cotton terry towelling and shrink-resistant all-wool blankets have a long life under conditions of frequent washing. Blankets of both types have been washed and tumble-dried over two hundred times and are still in a serviceable condition. The colour of the shrink-resistant wool blankets deteriorated when the Blowers and Wallace laundering technique was employed and the domestic Melbourne water supply containing iron compounds was used, but this discoloration can be avoided by modification of the laundry method.

Acknowledgements.

The work described was a joint investigation carried out by the writer in conjunction with the Royal Melbourne Hospital Central Linen Service and Group Laundry. The cooperation of the management and staff of the hospital laundry is gratefully acknowledged. Thanks are also due to Mr. R. W. Munday, who measured the blankets.

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ANTIBIOTIC SENSITIVITY OF ORGANISMS FROM EAR AND NOSE INFECTIONS.

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Lismore.

THIS paper gives the results of antibiotic sensitivity tests on organisms cultivated from 500 consecutive swabbings from infections of the paranasal sinuses and the external or middle ear (Table I).

The patients were in the far north coast district of New South Wales, in an area bounded approximately by the Queensland border, Tenterfield and Coffs Harbour.

The cultures and tests were performed by the staff of the Commonwealth Health Laboratory in Lismore. Sensitivity tests were done by the usual method, with the use of commercial disks on blood agar cultures.

Specimens were collected between January 15, 1957, and April 20, 1959.

In some of the earlier tests, erythromycin and triple sulphonamide were not included. This has been allowed for in the calculations of the percentage of sensitive strains.

Acknowledgement.

I wish to acknowledge the courtesy of Dr. M. A. Bundock, Medical Officer in Charge of the Commonwealth Health Laboratory in Lismore, with whose permission these results are published.

TABLE I.

Results of Antibiotic Sensitivity Tests.

Organism.	Number Grown from 500 Cultures.	Number of Cultures of Each Organism Sensitive in Vitro to Various Antibiotics.						
		Penicillin.	Tetracycline Group.	Chloramphenicol.	Streptomycin.	Triple Sulphonamide.	Erythromycin.	Polymyxin B.
Staphylococci	336 (67·2%)	117 (34·8%)	170 (50·6%)	316 (94·3%)	190 (56·5%)	65 of 266 (24·4%)	269 of 279 (96·4%)	Not tested.
Streptococci	51 (10·2%)	35 (68·6%)	43 (84·3%)	50 (98·0%)	28 (54·9%)	17 of 31 (54·8%)	33 of 36 (91·7%)	Not tested
Coliform bacilli	115 (23·0%)	5 (4·0%)	52 (45·7%)	103 (89·4%)	85 (73·9%)	30 of 87 (34·5%)	5 of 90 (5·5%)	Not tested.
Pseudomonas pyocyanea	28 (5·6%)	0	1 (3·6%)	8 (28·6%)	18 (64·3%)	3 (11·6%)	0	8 (28·6%)
Diphtheroids	8 (1·6%)	4 (50·0%)	5 (60·0%)	7 (88·0%)	5 (60·0%)	0	0	Not tested.
Friedländer's bacillus	5 (1·0%)	0	1 (20·0%)	5 (100·0%)	4 (80·0%)	0	0	Not tested.

Reports of Cases.

A CASE OF MULTIPLE NEPHROBLASTOMATA (WILMS'S TUMOURS) WITH SEVERE HYPERTENSION.

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A CHILD with nephroblastoma usually presents with a large abdominal mass. The case reported here is unusual as the presentation was with illness apparently resulting from severe hypertension before the primary renal pathological condition had been detected. An additional unusual feature was the presence of multiple tumour masses in one kidney.

Hypertension with nephroblastoma does not seem to be rare. From Daniel (1939), Silver (1947), and Bradley and Drake (1949), it seems that a slight rise in blood pressure occurs in over half the cases of nephroblastoma, severe hypertension being much rarer. Some of the latter type were described by the above-mentioned authors, and others by Koons and Ruch (1940), Hughes *et alii* (1949), Seelemann (1953), and Cox and Smellie (1956). The case of Hughes *et alii* presented with epistaxis and hypertensive encephalopathy when the tumour was still impalpable, and thus had features similar to the case to be described here.

Clinical Record.

The patient, aged 12 months, was first admitted to a country hospital on December 12, 1957, with the history of two weeks of irritability, desire for fluids only, and vomiting for one week. Until then he had been well except for mild bronchitis at the age of three months, with normal progress and weight gain.

On the original admission to hospital he was well hydrated, but obviously ill, with mottled peripheral

cyanosis and pallor. The left tympanum was inflamed. X-ray examination of the chest showed gross enlargement of both sides of the heart, but the lung fields appeared clear. The provisional diagnosis was congenital heart disease. Penicillin therapy was commenced. The next day his colour was normal, but there were purpuric spots on the forehead; the temperature was 100° F., and he was sweating profusely. On auscultation there was a definite triple rhythm and diastolic murmur. He was thought to have bacterial endocarditis superimposed on a congenital cardiac abnormality.

On December 13 the hæmoglobin value was 10·5 grammes per 100 ml. On December 15 tetracycline therapy was commenced. The respirations at this stage were somewhat rapid and laboured. Digitalis therapy, in doses of a quarter of a grain three times a day, was commenced.

On December 17 he had some œdema of both insteps. His temperature was now normal. Examination of the urine showed the albumin content to be "one-half". A skiagram of the chest showed apparent reduction in size of the right ventricle, but the left ventricle appeared to be still grossly enlarged. The diastolic murmur was not then heard.

On December 27 microscopic examination of a specimen of the urine showed it to be clear. Daily tests of the urine for albumin gave results varying from "one-sixth" to "one-third". There were occasional temperature rises to 100° F.

The patient was later referred to the Brisbane Children's Hospital, and was admitted there on January 6, 1958, aged 13 months. On admission he was irritable and restless, and there was gross wasting of the trunk and buttocks. The temperature was 101° F. The pulse rate was 120 per minute. The respiratory rate was 28 per minute. Other significant findings were as follows: the apex beat was in the fifth left intercostal space in the nipple line, and there was an apical mid-systolic murmur. The blood pressure was 210/160 mm. of mercury with the use of a 5 cm. cuff. Femoral pulses were very strong. There appeared to be gross enlargement of the left kidney on palpation, and the right kidney was suspected to be enlarged. The ocular fundi showed bilateral papilloedema, dilated veins and hæmorrhages, and white scars were scattered throughout. The provisional diagnosis was of malignant hypertension, possibly due to phæochromocytoma or renal disease or essential hypertension.

On January 6 the hæmoglobin value was 14·2 grammes per 100 ml. Microscopic examination of the urine revealed 15 leucocytes, 4 hyaline casts, 2 granular casts and six epithelial cells per high-power field.

On January 7 X-ray examination of the chest showed the heart to be markedly enlarged, probably affecting both the left and the right ventricles (Figure I). The blood urea content was 33 mg. per 100 ml.

On January 9 X-ray examination of the long bones showed that they were normal for age, with no evidence of tumour deposits.

On January 10 intravenous pyelography was performed. In the preliminary film an enlarged soft tissue shadow was seen overlying the left renal area. The right renal shadow was not well defined, but also appeared larger than normal. There was good concentration of the opaque medium by both kidneys at 10 minutes. The right calyces and pelvis appeared normal. The left calyces and pelvis showed stretching and distortion, and the upper end of the left ureter was displaced upwards and medially (Figure II). These appearances were considered suggestive of a multiple cystic condition.

On January 11 the injection of phentolamine ("Regitine") produced no fall in blood pressure.

Water concentration tests performed on January 14 and 15 showed that the specific gravity of the urine rose to only 1·012 from an early figure of 0·010. The blood urea content was 33 mg. per 100 ml.

On January 20 a urea concentration test showed that urea was concentrated to 2·4%, and 3·46 grammes out of 6 grammes were excreted in three hours.

On January 31 the blood pressure was 250/170 mm. of mercury. Most blood pressure readings were taken after sedation necessitated by his extreme irritability, and a

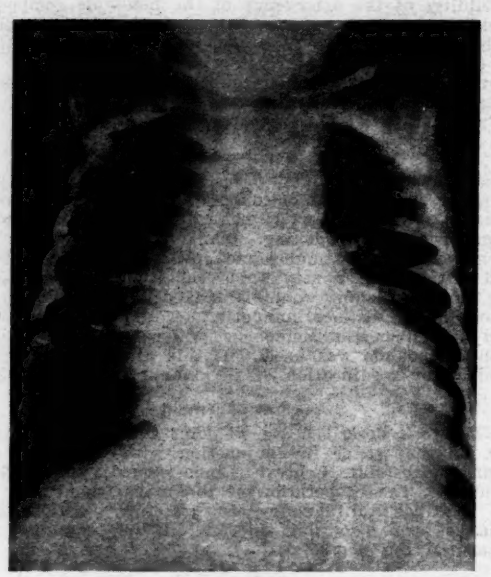

FIGURE I.
Skiagram of the chest taken on January 7, 1958.

5 cm. cuff was used for all readings. In a retrograde pyelogram the left kidney showed similar features to those in the intravenous pyelogram (Figure II), but the procedure was unsuccessful for the right kidney.

FIGURE II.
The retrograde pyelogram.

On February 3 the blood pressure was 170/?130 mm. of mercury. On February 4 the blood pressure was 250/170 mm. of mercury, and the blood urea content was 144 mg.

per 100 ml. The urine was generally of about a fixed specific gravity of 1·010, was strongly acid, and showed an albumin content varying from a trace to "two-thirds". He passed large volumes, and difficulty was experienced in maintaining his hydration.

On February 3 he developed signs of acute left ventricular failure with hepatic enlargement. This did not respond to treatment, and he died on February 4, aged 14 months. The diagnosis at the time of his death was of polycystic kidneys with secondary hypertension, but some doubt was expressed as to the correctness of this diagnosis.

Autopsy Findings.

The body was that of a well-nourished, pale, white male child of about average size for his age. There appeared to be slight œdema of the lower limbs. The significant findings were as follows. The right pleural and the peritoneal cavities each contained about 5 c.cm. of apparent transudate. Both lungs were moderately œdematous with a small hæmorrhage near the lower end of the right upper lobe. The heart was grossly enlarged, weighing 170 grammes (the normal range is about 25 to 65 grammes, according to Coppoletta and Wolbach, 1933). The left ventricle was grossly hypertrophied (Figure III);

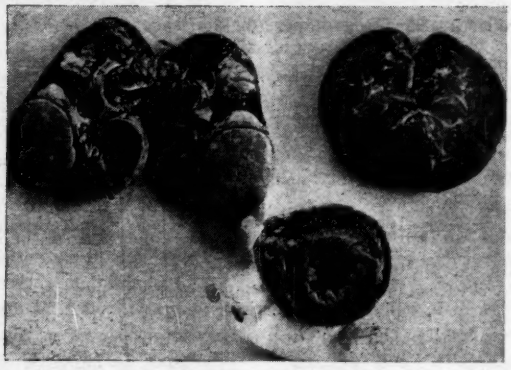

FIGURE III.

The left kidney—the largest tumour mass is towards the lower pole; the right kidney; section of the heart.

its wall was about 12 mm. thick. Neither congenital anomalies nor endocarditis were present. The liver was enlarged to about two and a half fingers' breadth below the right costal margin and weighed 600 grammes. On section it was engorged with blood and showed a faint "nutmeg" appearance.

The right kidney weighed 80 grammes (the normal range is about 20 to 60 grammes, according to Coppoletta and Wolbach, 1933). On section it was engorged with blood. No tumour or other masses were seen (Figure III).

The left kidney weighed 165 grammes. On external inspection there was seen to be coarse nodularity, and on section this was found to be due to the presence of three separate, lobulated, almost spherical, greyish tumour masses, from about 1·3 cm. to 4 cm. in diameter (Figure III). The larger lobules were encapsulated. None of these were seen to have burst through the renal capsule. The renal tissue was engorged, with distortion by the masses. The renal artery, the renal vein and their main radicles showed no evidence of stenosis by the masses, and there was no evidence of any other lesion capable of causing arterial or venous stenosis. Invasion of arteries or veins by tumour was not seen. No secondary deposits were found in other organs.

The pyelogram films were reviewed, and the multiple tumour masses were found to be responsible for the X-ray appearances.

Microscopic Examination.

Microscopic examination showed the masses to be typical nephroblastomata, with abundant renal blastoma type tissue containing structures resembling tubules and glomeruli, the latter often of quite advanced development. The stroma also showed areas of mesenchymal type with fat cell development, but aberrant muscle and other tissues were not seen. The tumour masses were of very similar structure to each other. No tumour was seen remote from the three tumour masses. Local tumour infiltration was evident at the edges of the masses, and in sections taken from the largest mass where it bulged the renal capsule showed slight infiltration of the latter, but no break through was apparent. Invasion of veins was not seen in numerous sections, though one recently thrombosed small vein was detected in the largest mass.

The renal tissue of both kidneys showed apparent tubular dilatation, focal areas of tubular atrophy with tiny cysts and fibrous replacement of renal tissue. The glomeruli in these areas showed hypertensive-type obliterative lesions. Arteries and arterioles showed hypertensive-type mural thickening. The vascular and glomerular changes were of the "benign" hypertensive type with slight "malignant" features apparent. These changes appeared to be equally advanced in both kidneys in numerous sections taken. Adjacent to the masses in the left kidney the renal tissue showed atrophy—as would be expected from local distortion. No tumour was seen in the right kidney.

The lungs showed chronic congestive changes and a few small hæmorrhages. The liver showed early chronic congestive changes. In these organs (including areas related to the pulmonary hæmorrhages) and other organs, no tumour was detected.

The Multiple Tumours.

The special case of bilateral tumours has attracted much attention. This group, of course, presents special surgical problems. Scott (1955) reviewed the literature and found that in 906 cases of nephroblastoma, 33 cases (3·6%) were bilateral. However, he found that for individual series of cases in the recent literature, the true incidence appeared to be very much less. There was also evidence that, in advanced cases with much tumour growth, bilateral tumours appeared to be more common than in the less advanced cases, suggesting that metastasis to the other kidney does occur. On the other hand, there were cases in which bilateral tumours were found with little or no evidence of metastases in other organs. Scott's own case of a patient with a large tumour of one kidney and multiple discrete tumours of the other kidney was one of these. The case presented here is of this type. In such cases the multiple tumours may have arisen independently.

In considering the differential diagnosis of abnormal appearances in one or both kidneys, the possibility of an unusual type of Wilms's tumour should be remembered.

The Hypertension.

Is the hypertension in this type of case related to a humoral agent produced by the tumour, or to renal ischæmia? Cox and Smellie (1956) have discussed this problem.

If the former were the case, one would expect that, should the high blood pressure fall after nephrectomy, it would rise when secondary deposits develop. In most cases this does not occur. Where the blood pressure does rise after nephrectomy, there is often evidence that the region of the pedicle of the opposite kidney has become affected by spread of the tumour; but Bradley and Drake (1949) reported a case in which hypertension recurred twice after recurrence of the tumour, with no evidence at autopsy of involvement of the other kidney. In this case, therefore, it seems that the tumour produced some pressor substance.

Metastases are frequently less differentiated than the primary tumour, and so, therefore, there may be biochemical differences; so failure of a return of hypertension with metastases does not exclude the formation of a pressor agent by the primary tumour (Cox and Smellie, 1956). Bradley and Pincoffs (1938) failed to demonstrate pressor activity in extracts of tumour tissue.

Daniel (1939) and Bradley and Drake (1949) could find no relationship between the incidence of hypertension and the tissue structure of the tumours. The importance of a pressor agent in the majority of these cases is still in doubt.

Renal ischæmia seems to be a satisfactory explanation in many cases. There are cases in which the hypertension seems to be related to partial obstruction of the renal artery, as in Goldblatt's experiments (Goldblatt, 1937). This seemed likely in the case reported by Cox and Smellie (1956), and also in the case of lymphosarcoma reported by Blatt and Page (1939), and the case of neuroblastoma reported by Fust and Warres (1950). In all these cases the patients were hypertensive. Koons and Ruch (1940) suggested the possibility that hypertension in the case presented by them may have been related to the fact that the tumour was wrapped almost entirely around the affected kidney, in a manner similar to the experiments of Page (1939), who produced hypertension by wrapping the kidneys of experimental animals in "Cellophane".

A rise in renal intracapsular pressure due to the rapidly growing tumour inside the inelastic capsule may take place and may contribute to ischæmia. This could be an important factor in these rapidly growing tumours, as compared with the slower growing renal carcinoma in adults, where hypertension with evidence of relation to the tumour is less common (Cox and Smellie, 1956).

The causes of the hypertension in the case reported here cannot now be determined.

Symptoms and Signs.

In the case reported here, one does not know for how long the hypertension had been present before it was detected, but the presence of cardiac symptoms and signs when the patient was first admitted to hospital suggests that it had been present for some time, so the symptoms, renal dysfunction and other features would appear to have been due to the hypertension.

Summary.

A case is presented of a child, aged 13 months, in whom multiple small nephroblastomata in one kidney were associated with severe hypertension, which appeared to have produced symptoms before the primary renal pathological condition was detected. These multiple tumours were responsible for a misleading appearance in the pyelograms

The possible ætiology of hypertension in cases of nephroblastoma is discussed.

Acknowledgements.

This work was done while I was at the Brisbane General Hospital.

I wish to thank Dr. J. Weedon, who kindly provided the history of the patient's first admission to hospital.

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Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"A Pocket Book of Proprietary Drugs", compiled by Alistair G. Cruikshank, F.R.C.P.E., and Cornelius Stewart, L.R.C.P. & S.E., M.P.S.; 1959. Edinburgh and London: E. & S. Livingstone, Limited. 6″ × 6¼″, pp. 236. Price: 10s. 6d. (English).

Covers some 1500 preparations.

"An Introduction to Medical Genetics", by J. A. Fraser Roberts, M.A., M.D., D.Sc., F.R.C.P.; Second Edition; 1959. London, New York, Toronto and Melbourne: Oxford University Press. 9¾″ × 6¼″, pp. 273, with 107 illustrations. Price: 59s. 3d.

The author is Director of the Clinical Genetics Research Unit, Medical Research Council.

"Il Timo: Studio Fisiopatologico Clinico E Terapeutico Delle Affezioni Chirurgiche Dell'Organo", by G. Sarteschi and G. R. Bettolo; 1956. Pisa: Omnia Medica. 9¾″ × 6¼″, pp. 416, with 172 illustrations. Price not stated.

A treatise on the thymus gland entirely in Italian.

"Human Nutrition and Dietetics", by Sir Stanley Davidson, A. P. Meiklejohn and R. Passmore; 1959. Edinburgh and London: E. & S. Livingstone Ltd. 9¾″ × 6″, pp. 857, with several illustrations. Price: 84s. (English).

The author's intention has been "to set out the whole wide subject of human nutrition in proper perspective and to bring its many aspects together into one volume".

"Principles of Radiation Dosimetry", by G. N. Whyte; 1959. New York: John Wiley & Sons Inc. London: Chapman and Hall Ltd. 9″ × 5¾″, pp. 131, with illustrations. Price not stated.

Intended primarily for the science graduate faced with the problem of determining radiation dose.

"Cancer of the Skin", by John C. Belisario, C.B.E., E.D., M.D., Ch.M., D.D.M.; 1959. London and Sydney: Butterworth & Company (Publishers), Limited 8¾″ × 5″, pp. 354, with 201 illustrations. Price: 68s. 6d.

A Sydney dermatologist writes from extensive experience with a particular background of Australian conditions.

"The Molecular Basis of Evolution", by Christian B. Anfinsen, 1959. New York: John Wiley & Sons, Limited. London: Chapman & Hall, Limited. 9″ × 5¾″, pp. 244, with 99 illustrations. Price not stated.

The author "regards the evolutionary process as the integrated form of genetics and protein chemistry".

"Physiology of Prematurity: Transactions of the Third Conference March 25, 26 and 27, 1958, Princeton, N.J.". Edited by Jonathan T. Laman, M.D. New York: Josiah Macy, Jr., Foundation. 9″ × 5¾″, pp. 158, with 56 illustrations and 9 tables. Price: $3.00.

Contains papers and discussions on metabolic and enzymatic changes during development, on bile pigment metabolism and liver function in premature infants, on studies on congenitally jaundiced rats, on experience with glucuronic acid in treatment of bilirubinæmia and on biochemical mechanisms in glucuronide formation.

The Medical Journal of Australia

SATURDAY, NOVEMBER 14, 1959.

THE MEETING OF THE FEDERAL COUNCIL.

THE Federal Council had a full platter before it at its meeting in Brisbane at the end of September, as will be seen from the report of the meeting published in this issue (see page 732). Most interest attached to the conference with the Minister for Health, which occupied a substantial part of one day. Three main items were dealt with at this conference: special accounts, anomalies in the schedule of medical benefits and the Government's proposed extension of pharmaceutical benefits. The Government has accepted a compromise in the matter of special accounts and is intending to authorize payments to patients in non-recognized hospitals who have a disease which would normally require treatment in a recognized hospital if the treatment given is substantially that which would have been received in a recognized hospital. On the question of anomalies in the schedule of medical benefits, the Minister intimated that this was receiving attention and promised to consider further representations. The increase in maximum surgical benefit which is already in sight is certainly an improvement, and it is gratifying to know that the Government has taken substantial notice of the Federal Council's painstakingly compiled recommendations in relation to anomalies. Much more adjustment is still desirable, particularly in relation to benefits for specialist consultations, and it is to be regretted that the Government did not accept the Federal Council's recommendation in this regard. The Government's proposals to extend pharmaceutical benefits were, the Minister made it quite clear, to be proceeded with, and appropriate legislation has in fact since been introduced into the Federal Parliament. This will need fuller discussion later, when the details of the new scheme are clearer; only then can it be safely appraised and the medical profession determine its practical attitude. However, it is impossible not to be uneasy about the scheme and to wish that the Government may defer implementing it until the profession has had a chance to see what constructive alternative suggestions can be made. The Federal Council expressed its sincere sympathy with the Government's desire to control rising costs and to promote financial stability in relation to pharmaceutical benefits, but it did think that time should be given to trying to find a better way out. As it apparently is to be, the scheme will widen the range of pharmaceutical benefits to approximately what has up till now been available under the Pensioner Medical Service, and a 5s. charge will be imposed (except of course for pensioners). Two side comments at least may be made at this stage. First, the Government is abandoning the principle of supplying free only drugs in the life-saving and disease-preventing group; this is to be regretted (despite the fact that we cannot seriously dispute the Minister's suggestion that the list has already been stretched to the limits of its original meaning), as all over the world Australia has for years now been congratulated on having a sanely limited standard for the supply of free medicines. Second, it is equally to be regretted that the Government should so hastily widen the scope of its pharmaceutical benefits, with an inevitably steep rise in costs which must amount to many millions of pounds, when it was unable to find one penny towards supplying essential equipment for medical research on a list which was recently compiled with care and discretion by the National Health and Medical Research Council and the cost of which amounted in all to only a quarter of a million pounds.

Another matter dealt with at the meeting which we cannot pass by was the renaming of the Federal Council Medical Monograph Fund, so that it will now be known as the Mervyn Archdall Medical Monograph Fund. This decision is most gratifying. The idea of the Medical Monograph Fund was Mervyn Archdall's own, and most of the money in the Fund was gathered by his own personal canvass; in fact, the Fund owes its existence almost entirely to him. This was not the least of the many significant contributions Mervyn Archdall made to the advancement of Australian medicine while he was Editor of this Journal, and it is fitting that his name should be perpetuated in association with the Fund.

The most momentous decision of the Federal Council at this meeting, one of the most momentous it has made for many a meeting, was expressed in the following resolutions:

> That in the opinion of the Federal Council the time is now opportune to proceed with the formation of an Australian Medical Association, independent of, but affiliated with, the British Medical Association.
>
> That the opinion of the Federal Council be forwarded to the Branches with a request that the views of the members be obtained.
>
> That the document prepared by the General Secretary containing the advantages and disadvantages of the proposal be approved by the Federal Council.
>
> That the Executive Officers be empowered, prior to the next meeting of the Federal Council, to formulate detailed proposals concerning the constitution and machinery of an Australian Medical Association.

This decision, which had been foreshadowed by a preliminary discussion on the subject at the March meeting of the Federal Council, rose out of a growing realization that the organized medical profession in Australia had its own outlook and its own opportunities and problems, which it had met quite satisfactorily on its own, hastened by a rather more rapid (even startlingly sudden) appreciation of the fact that leaders of the Association in England had no objection to such a move and indeed considered it overdue.

The matter of the new Association is now in the hands of the Branches, but there seems no reason to doubt what will, in general terms, be done. The General Secretary of the Federal Council, who is at least as well informed on these matters as anyone in Australia, has set out the pros and cons in a document that leaves little room for argument, and the Federal Council has approved the document. The following advantages are listed:

1. Complete autonomy of the medical profession of Australia would result.

2. Decisions of procedure and action deemed advisable for the organised profession in Australia would be able to be made without delay and further reference.

3. The ultimate decision on matters virtually affecting the interests of the profession in Australia would lie with a body composed of all Australian elements, fully equipped with the knowledge of local conditions and problems.

4. On the financial side, the present B.M.A. overseas subscription rate would no longer to be paid to the Parent Body in the U.K., i.e. an amount of approximately £25,000 would be retained in Australia. However, it is impossible to forecast at this stage the probable saving, if any, likely to accrue from this to the individual member, as undoubtedly in the setting up of a new association there are bound to be some initial and unforeseen expenses.

5. In the field of medico-political negotiations it is believed that the importance of such negotiations in future will increase and although in the past the name of the British Medical Association has always carried with it the great prestige and high esteem it so rightly deserves, it is nevertheless felt that a purely Australian association, with the full representation of the Australian medical profession, would have an even stronger and greater part to play.

Against these are offered two disadvantages—in both cases with a neutralizing qualification:

1. The effect of disruption of the close and traditional ties which have existed with the British Medical Association for such a long period, and the very real sentiment attached thereto, needs to be carefully considered. However, as has been evidenced in the case of other medical associations of Commonwealth countries, particularly Canada and South Africa, close affinity and affiliation with the B.M.A. has been shown to be possible, and, in fact, none of the existing attachments of friendship and cooperation with the Parent Body need to be lost.

2. Members of a Medical Association of Australia would no longer routinely receive the British Medical Journal, but for those members in Australia still wishing to receive this Journal a separate annual subscription of two guineas would provide same.

Before the Australian Medical Association becomes a reality there will undoubtedly be a multitude of administrative and legal problems to be sorted out, and some of them may be quite thorny. Particularly serious thought will need to be given to the nature and powers of the central organization. Something more will be needed than a purely advisory body such as the present Federal Council. At the same time, the Branches, operating in the several sovereign States of the Commonwealth, will need to retain their autonomy in a great many matters. Just what sort of central legislative body will be suitable and financially practicable in this large continent remains to be determined. However, none of these or of the other conceivable problems is insoluble with goodwill, and on that we may surely count. One thing is certain. This step will not remove us in spirit one inch away from the present close association with our colleagues in Britain. The experience of, for example, the Canadian Medical Association makes that clear, and it is good that we can be so reassured. The British Medical Association and what it stands for must be thanked for a great deal of the true dignity and good repute which enable the medical profession as a whole to continue to hold its head high in this country. This is a rich heritage. It need not be cast aside but will, we are confident, be woven as a strong and bright thread into the fabric of the Australian Medical Association.

Current Comment.

AMPHETAMINE AND ATHLETIC PERFORMANCE.

IT is probable that references to the use of drugs to stimulate athletic performance, which occasionally achieve fleeting prominence in the columns of the daily Press, are generally exaggerated. Athletic organizations naturally condemn any such suggestions, and this condemnation is supported on both medical and ethical grounds. However, in view of the undoubted stimulant action of amphetamine, which is the drug nearly always concerned, it is inevitable that some individuals should be tempted to try its effect, and it is therefore important to establish what this effect actually is. In 1957, as a result of allegations about the widespread use of amphetamine substances by coaches, trainers and athletes, the Board of Trustees of the American Medical Association appointed a special "Committee on Amphetamines and Athletics". This committee conducted a survey, as a result of which it was concluded that the observed use of these drugs was apparently very small. A review of the available literature also revealed the absence of any sound evidence that improvement in athletic performance was to be expected from the use of these drugs. The committee therefore supported two independent investigations into the effect of the use of amphetamines on athletic performance, and the results of these investigations have now been published.

At Harvard University, G. M. Smith and H. K. Beecher[1] conducted an elaborate series of controlled trials. Preliminary trials had suggested that some athletes could obtain a consistent improvement in performance by taking a dose of amphetamine sulphate equivalent to 14 mg. per 70 kg. of body weight two to three hours before a race. Six experiments were then carried out in which the performance of swimmers, runners, weight-throwers and shot-putters was studied with a double-blind technique, the athletes being given amphetamine in the dosage already stated, a placebo, or, in some experiments, secobarbital. The last was included as it was thought that results might be influenced if the subjects could correctly deduce from any unusual feelings or sensations that they had received "pep pills"; it was also used in an attempt to clarify the question as to whether an amphetamine improvement, when it occurred, might not be due to changes in attitude and psychological state. In their most elaborate trial, Smith and Beecher had the cooperation of 15 swimmers, each of whom swam his event twice on each of 12 consecutive experimental days, four times under each of the three drug conditions. This gave a total of 360 measured performances. Smith and Beecher note that the cooperation on the part of the subjects in this experiment was exceptionally good; out of the 180 individual tests, only five began more than five minutes late. In all three classes of athletes, the majority of subjects performed better under the influence of the standard dosage of amphetamine than after taking the placebo. The improvement was statistically significant in each case, 85% of the weight-throwers, 73% of the runners and 67% to 93% (in different circumstances) of the swimmers performing better after taking amphetamine than after the placebo.

To make sure that the results obtained were applicable to competitive conditions an ingenious ruse was used in

[1] *J. Amer. med. Ass.*, 1959, 170: 542 (May 30).

one experiment to obtain maximum performance. As well as the object of the experiment being explained to the participants and the conditions of a race being simulated by cheering from the side lines, the swimmers were told that each man whose mean experimental time equalled or beat his mean competitive time would be treated to a steak dinner, where he could order anything he wanted up to $7.50. Smith and Beecher explain that this incentive was chosen because it was discovered that winning a steak dinner appeared to have a symbolic significance for the boys, as this was sometimes offered as a reward by their coaches in athletic contests. In the event, two of the swimmers broke their lifetime records and five came within 0·3 second of their lifetime records.

The second trial was conducted by P. V. Karpovich[2] at Springfield College, Massachusetts. In two series of experiments the participants were runners and swimmers. Some of the tests were made under laboratory conditions (treadmill), but some were made in actual competition. The dose of amphetamine was 10 mg. of amphetamine given one hour before the test in the first series, and 20 mg. given 30 minutes before the test in the second series. As in Smith and Beecher's experiments, a double-blind technique was employed, using amphetamine sulphate and a placebo. Karpovich found that, with the smaller dose of amphetamine, the participants were unable to distinguish by subjective sensations whether they had received amphetamine or the placebo, but that with the larger dose they could tell correctly three times out of four. The results were inconclusive. On one occasion when some runners did exceptionally well, they begged for more "miracle pills"; on checking, it was found that some of them had received the placebo. In all, 54 male college students were timed in a total of 532 tests. Only three men (all swimmers) showed a consistent improvement in their times when taking amphetamine (20 mg.).

The Harvard trial appears to show conclusively that in adequate dosage, given a sufficient time before the event, amphetamine will improve athletic performance. The failure of the Springfield College trials to show any significant improvement under the influence of amphetamine may be attributed to the smaller dosage and to the short interval between the taking of the drug and the beginning of the test. However, it should be noted that even in the Harvard trial some athletes did less well with the help of amphetamine than without it. Commenting on these reports, A. J. Ryan,[3] chairman of the Committee on Amphetamines and Athletics, reiterates his committee's condemnation of the use of amphetamines in sport and emphasizes the obligation of practitioners to help prevent such usage by prescribing them only for well-recognized medical indications. The abuse of amphetamines has many other facets, and he adds that it is acknowledged that there is an illegal traffic in the amphetamines in the United States and that problems of its control are still to be solved.

MEDICINE IN KANSAS.

AN experienced author, Thomas N. Bonner, Chairman of the Department of Social Sciences and Professor of History at the University of Omaha in the United States of America, has made a further addition to his writings on the subject of doctors in a valuable and interesting contribution to the history of American medicine.[1] Giving chapter and verse for all the strange facts he has unearthed from the records, and with the true objectivity and thoroughness of the trained historian, he has succeeded in painting a lurid picture of certain "goings on" in the new State of Kansas from the middle of last century to the present day. Open confession may be good for the soul, but there are times when it is not necessarily so good for the reputation.

To begin with, a Federal Act of Parliament was passed in 1854, which not only provided for Kansas to be opened up as a new territory, but left it open to the people to make their own decision as to which side they would take on the burning question of slavery. Before long the whole territory became a battleground for opposing elements within its own borders, and strife was intensified by the unceremonious intrusion of belligerent propagandists who continued to invade it from the neighbouring States. It was many years before the contending parties began to forget their differences, so that the unsettled conditions were hardly conducive to the establishment and proper organization of efficient medical services for the hardy pioneers, who were eager to subdue the virgin forest and to convert the rolling prairies into productive farms.

Reading between the lines could prove a dangerous habit; but it seems that medical pioneering in the State of Kansas may have been adversely affected in its progress by a series of unfortunate circumstances. There is little evidence that the Federal Government showed anything but complete indifference to the general welfare or internal struggles of its latest acquisition. Any progressive movement for the improvement of medical services was sure to be undermined by the intrusion of party politics or the opposition of vested interests powerful enough to influence the governing body of the State, thus rendering ineffective any persuasive methods of correction put forward by the progressive American Medical Association. Lastly, there is the possibility that an obstinate isolationist policy may have deterred influential people in medical and political circles from becoming aware of the clamour for reforms in medical education and practice that for a long time had been receiving wide publicity in other parts of the world. There may be some truth in the adage that people usually get the government (or perhaps the medical services) that they deserve.

In spite of its vicissitudes, including the unrestricted freedom of a large army of quacks and charlatans consistently arrayed against the regular medical profession, Kansas can still look back with pride on the achievements of a few courageous medical pioneers. They braved the elements, faced up to their responsibilities, and introduced medical reforms in psychiatry, public health and medical education in their own State; by the originality and outstanding success of their early endeavours they were guiding stars for the rest of the world.

It seems strange that enlightened medical opinions failed to assert themselves until well on in the present century. It may have been the sobering influences and experiences of the first World War, and the sufferings endured in the subsequent financial depression, which eventually turned the tide of progress and made Kansas City and its university one of the great medical centres of modern times.

A NEW HEART-LUNG MACHINE.

WE have recently received a brief report[1] of what appears to be a new refinement in heart-lung machines. R. E. Gross, of Boston, and his associates have perfected an apparatus which can be used for two successive open-heart operations with only one priming of donated blood. The blood of the subject of the second operation must of course be strictly compatible with that of the subject of the first, as well as with the donated blood, but the saving in the amount of blood used could be considerable, and this must be a serious consideration in those centres where open-heart surgery is extensively practised. An instance is quoted in which the first operation was started at 8 a.m., and was completed by 10.30 a.m.; the second operation was then started without repriming the machine, and the team adjourned for lunch at 12.30 p.m.

[2] *J. Amer. med. Ass.*, 1959, 170: 558 (May 30).

[3] *Ibidem*, 1959, 170: 562 (May 30).

[1] "The Kansas Doctor: A Century of Pioneering", by Thomas Neville Bonner; 1959. Lawrence: University of Kansas Press. 9" × 6", pp. 352, with illustrations. Price: $5.00.

[1] In *Heart Research Newsletter*, volume 4, number 3 (circulated by the American Heart Association).

Abstracts from Medical Literature.

RADIOLOGY.

The Elimination of Breast Shadows.

C. ALEXANDER (*Proc. Coll. Radiologists Aust.*, December, 1958) discusses methods of eliminating confusing breast shadows in chest radiography. He points out that large breasts may so obscure the lung bases as to make assessment most unreliable if conventional techniques are employed. Various methods of overcoming this problem were investigated until the alternative of radiography with the patient in the supine position was tried. The author states that in a trial period of 12 months this technique has proved invariably effective. The cassette is placed directly beneath the patient, who is positioned so as to bring the scapulæ forward. The focal-film distance recommended is five feet. It is pointed out that in chest radiography the supine position is generally used only for patients unable to sit up, and for the investigation of pleural effusions; it is used reluctantly because of the deeply entrenched conviction among radiologists that, to be of good quality, a chest X-ray picture must be taken with the patient erect. The author states that if standard chest technical factors and full distance are employed this conviction is incorrect, except in so far as it applies to the heart and mediastinum.

Thromboembolism of the Lungs.

J. ARENDT AND M. ROSENBERG (*Amer. J. Roentgenol.*, February, 1959) state that the incidence of thromboembolism of the lung of either surgical or medical origin has remained high in spite of greater clinical awareness and better methods of prevention. The clinical signs and symptoms are frequently suggestive, but X-ray examination or angiocardiography is in a high percentage of cases decisive. Thromboembolism without infarction presents as an abnormal transparency of the involved lung segment with absence of one or both of the large hilar vessels. The heart shadow assumes a peculiar shape, best described as the "amphoric" type. In the absence of both hilar vessels (pulmonary arteries), the presence of a large saddle embolus must be considered. A thrombus or embolus which is located slightly more peripherally within the main branches of the pulmonary arteries causes a buckling and aneurysmal widening of the vessel, with either a sharp cut-off or a tapering shadow at the peripheral end of the embolus. Such thrombus or embolus is compatible with life, and leads to the development of either acute or chronic cor pulmonale. In contrast to the cor pulmonale of obstructive emphysema, the position of the diaphragm is elevated, the heart does not assume the vertical position, and develops within a short time enlargement of inflow and outflow tracts of the right ventricle. Thromboembolism with infarction does not, as a rule, present Westermark's sign of increased translucency of a lung segment, since it occurs mostly in a congested lung with dilated bronchial arteries and numerous collateral vessels. Infarction is common in mitral stenosis, hypertensive heart failure and coronary insufficiency. Infarcts represent an area of ischæmic necrosis usually located at the periphery of the lung. They are rarely wedge-shaped, as the apex of the wedge is cut off. A truncated cone or an umbrella shape results, which is quite characteristic. Smaller infarcts frequently have a cuboid or meniscus-like appearance. In the costo-phrenic angle the "hump-shaped" elevation on the medial side of a small patch of pleurisy has frequently been observed, and appears diagnostic. The base of an embolic infarct is sometimes the interlobar fissure line, along which it forms a parabolic shadow, which is best seen on a lateral skiagram.

Acromegaly.

H. L. STEINBACK, R. FELDMAN AND M. B. GOLDBERG (*Radiology*, April, 1959) discuss the radiological diagnosis of acromegaly on the basis of 27 patients seen at the University of California Medical Center. They state that the diagnosis of acromegaly is primarily clinical. The radiological diagnosis can be accurately established in an examination of the skull if the sella turcica is significantly enlarged, and if this finding is accompanied by an elongated mandible with a wide angle and enlarged sinuses. A thick scalp and hyperostosis of the inner table of the skull in women would further substantiate the diagnosis. This combination of morphological changes, however, was present in only a few patients, and in many cases a diagnosis of the disease by radiological methods alone was not feasible. All of these features, except enlargement or erosion of the sella turcica, can be found in some apparently normal individuals. This is true also of other accepted diagnostic radiological criteria such as enlargement of the tufts of the terminal phalanges, widening of the tubular bones, hypertrophic spurring at tendinous insertions, and enlargement of the vertebral bodies. The presence of marked thickening of the soft tissues, best seen in the fingers and toes, is particularly significant. Without this finding the diagnosis of acromegaly should be looked upon with suspicion. This thickening is slightly less if the disease is quiescent, but is still quite obvious. The presence of thick soft tissues is not diagnostic of acromegaly, but their absence is highly significant. The association of thickened articular cartilages (seen as wide joint spaces) of the hands and wrists with hypertrophic changes of the adjacent periarticular surfaces is suggestive; similar periarticular spurs are seen in osteoarthritis, but in such cases the cartilages are not thickened. The acromegalic joint may ultimately be involved in a degenerative process, and it cannot then be differentiated from osteoarthritis. A peculiar constriction of the shafts of the proximal phalanges and matatarsal bones of the foot was observed in most of the patients; this has been seen in a few normal subjects but must be quite rare. The results of this study indicate that skiagrams of the feet should be considered along with those of the skull and hands in the routine evaluation of acromegaly. The posterior borders of the lumbar vertebræ may show well-marked concavity. This change could be due to increased moulding resorption of the central posterior surfaces of the vertebral bodies as a direct result of the excessive quantity of growth hormone or, secondarily, of pressure by the enlarged soft tissues in the spinal canal. The appearance resembles that of the lobulated posterior surfaces of the spinal column sometimes seen in patients with soft-tissue tumours of the spinal canal.

Primary Staphylococcal Pneumonia in Infants.

G. SCHULTZE (*Amer. J. Roentgenol., February, 1959*) discusses unusual radiological manifestations of primary staphylococcal pneumonia in infants and young children. The radiological features include: (i) Localized parenchymal infiltrations; these are often of lobar distribution and involve one to three lobes of the same side; bilateral involvement occurred only five times in a series of 41 cases, and in four of these it was minimal and transient. (ii) Pleural involvement; most frequently this takes the form of an empyema, and it was present in approximately 90% of cases; spontaneous pneumothorax and pyopneumothorax occurred in approximately 25%. (iii) Development of pneumatoceles; these are emphysematous cysts or cavities probably arising from small areas of necrosis located in the peribronchial interstitial tissue; these areas communicate with bronchi through small sinuses and are inflated rapidly by check valve action of the œdematous bronchial mucosa or luminal secretions. They usually form in the most densely infiltrated areas, are thin-walled, and sometimes contain fluid. During the acute stage of the disease they often, within hours, change considerably in number, size and position. While they may be as small as 0·5 cm. in diameter, they may expand or coalesce to form very large cysts indistinguishable from, and producing effects similar to, tension pneumothorax. This is especially true if they are situated anteriorly. Marked parenchymal and pleural change may remain after complete clinical recovery from the disease; usually, however, this disappears within two weeks to two months and corrective surgery should not be undertaken prematurely. The average period from onset to complete healing of the disease has been approximately four weeks. Not infrequently, residual, asymptomatic pneumatoceles persist for longer periods even up to six to eight months. Since they usually exhibit slow spontaneous diminution in size and final disappearance, they should not be removed surgically. Many so-called "congenital cysts" in infants are probably acquired in this way.

Hydrocortisone in the Treatment of Severe Urographic Reaction.

F. W. WRIGHT (*Brit. J. Radiol.*, May, 1959) describes a case of very severe vasomotor reaction following the intravenous injection of a contrast medium for urography, in which the patient recovered after hydrocortisone had been given intravenously. A male, aged 31 years, was referred for urographic examination after an attack of left renal colic and subsequent hæmaturia. He had never previously had any injections of contrast media. He had no history of hay fever

or asthma, or of any other sensitivity, and no test dose of the medium was given. Twenty millilitres of 45% sodium diatrizoate ("Hypaque") were injected over a period of three minutes. He experienced no untoward symptoms at the time of injection. Seven minutes after the injection he complained of tightness of the chest and neck and a general feeling of being unwell. He was seen to be sweating and to be rapidly developing peripheral cyanosis and peripheral circulatory failure. His radial pulse was still present. He was given an antihistamine, 10 mg. of chlorpheniramine maleate intravenously, and was tipped head down. His systolic blood pressure was then 50 mm. of mercury. During the next five minutes his condition continued to deteriorate. His radial pulse became impalpable. Later, his carotid pulsation, which had previously been readily visible, could no longer be seen. His heart sounds were inaudible, and he had lost consciousness. He was given intravenously 100 mg. of hydrocortisone sodium succinate in 2 ml. of distilled water. Half a minute later he was obviously improving, and within a minute had regained consciousness. Two minutes later his systolic blood pressure was again 50 mm. of mercury. During the next three hours his blood pressure slowly returned to normal. Soon after this he was allowed to return home. Severe reactions to urographic media need rapid treatment, and such treatment may be life-saving. With vasomotor reactions the main lines of treatment in the past have been adrenaline, antihistamines and nikethamide. Newer drugs such as noradrenaline and hydrocortisone should also be considered. Hydrocortisone sodium succinate ester is alcohol-free, and can be rapidly dissolved in water. The usual dose of 100 mg. can be injected in half to one minute. This dose may be repeated if there is little effect or if a relapse occurs. It can also be given by intravenous drip infusion if more prolonged treatment is required. Transient high blood levels of hydrocortisone do not involve any real risk of side effects. It is suggested that it should be available for immediate use in every X-ray department.

PHYSIOLOGY.

Effect of Posture on Pulmonary Dead Space.

R. L. RILEY *et alii* (*J. appl. Physiol.*, May, 1959) discuss the effect of posture on pulmonary dead space in man. They report that physiological dead space was determined in the supine and upright postures by simultaneous sampling and subsequent analysis of arterial blood and expired gas for P_{CO_2}. In seven normal men there was invariably a higher dead space in the upright than in the supine position. The difference averaged 83 ml. and was statistically significant. The ratio of dead space to tidal volume also invariably increased on assumption of the upright posture. Evidence is presented for believing that most of the change in physiological dead space resulted from a change in alveolar dead space. Estimated changes in the ratio of alveolar dead space to alveolar tidal volume suggest that approximately one-seventh of the total number of alveoli became non-perfused on changing from the supine to the erect posture. These findings are consistent with bronchospirometric and hæmodynamic evidence that the apex of the lung is virtually non-perfused in the resting human subject in the upright posture.

Effect of Rhythmic Pressure on Blood Flow.

R. A. LOANE (*J. appl. Physiol.*, May, 1959) reports that rhythmic inflation to 110 mm. of mercury of a pneumatic cuff around the ankle of a seated subject reduces the venous pressure in the foot and is found by three methods—venous occlusion plethysmography, heat flow and calorimetry—to increase the rate of blood flow through the foot. The increases measured by the three methods are not, however, in quantitative agreement and it is not possible to decide how large the increase may be. It is considered, however, that the increase in flow is probably of the same order as the increase in perfusion pressure and not greatly in excess of this increase.

The Secretion of Hypotonic Saliva.

S. W. BRUSILOW AND R. E. COOKE (*Amer. J. Physiol.*, April, 1959) discuss the role of parotid ducts in the secretion of hypotonic saliva. They describe a technique whereby intraglandular concentration patterns of saliva are developed in the resting dog parotid gland between periods of maximum stimulation. The period of rest was varied from five to 70 seconds. The gland was stimulated maximally to a maximum degree after this rest period and each drop of saliva (averaging 20 mg.) was separately collected and analysed. This fluid thus represented saliva that was within the gland during the rest period until saliva newly formed in the acinus replaced it. It was found that sodium and chloride concentrations were lowered in a relatively distal segment of the gland and were raised in a more proximal segment. The depth of fall of sodium and chloride concentrations was related to the length of time the fluid remained in the gland. No change was noted in the potassium concentration until it rose in a relatively proximal portion. The results suggest that there are at least two sites within the gland which transfer electrolyte: a distal locus which reabsorbs sodium chloride and a proximal locus which elaborates relatively isotonic fluid. The suggestion is made that the former represents the ducts and the latter represents the acinus.

Oxygen Transport in Hæmorrhagic Shock.

J. W. CROWELL, R. G. FORD AND V. M. LEWIS (*Amer. J. Physiol.*, May, 1959) discuss oxygen transport in hæmorrhagic shock as a function of the hæmatocrit ratio. They state that the oxygen consumption, arterial and venous oxygen concentration, and arterial blood pH were measured, and the cardiac output, peripheral resistance and maximum oxygen transport capacity determined in 75 dogs with different hæmatocrit ratios in which the systolic blood pressure had been maintained at 30 mm. of mercury for 15 minutes. The oxygen consumption increased as the hæmatocrit ratio increased until the hæmatocrit ratio reached 42. However, an increase in the hæmatocrit ratio above 42 caused a decrease in oxygen consumption. This optimal hæmatocrit ratio occurs because of the dual role of the hæmatocrit ratio in determining oxygen content of blood and blood viscosity. A curve obtained by multiplying cardiac output by arterial oxygen showed that when the hæmatocrit ratio is 42 the oxygen transport is maximal. The oxygen consumed by the animal was determined by the oxygen available. Arterial blood pH was highest in those dogs with the greatest oxygen consumption, but the pH was below limits compatible with life in the anæmic animals. Total peripheral resistance increased greatly as the hæmatocrit ratio increased. Analysis of the data showed that the rate of maximum resistance to hæmorrhagic shock coincides with the hæmatocrit ratio range of maximum oxygen transport. Also, the rate of development of an oxygen debt determines how long the animals can remain hypotensive without developing irreversible shock and indicates that, regardless of the hæmatocrit ratio, a fixed oxygen deficit must occur before irreversible shock develops.

Gastric Distensibility and Age in the Mouse.

W. MCARTHUR, T. OGAWA AND H. NECHELES (*Amer. J. Physiol., May, 1959*) report that gastric distension and age appear to play a role in ulcer formation in the pylorus-ligated mouse. For this reason distensibility of the stomach of albino Swiss male Rockland R.A.P. mice was investigated. The excised stomach was ligated at the pylorus and saline was injected slowly through a tube in the œsophagus. Pressure and maximum volume of saline used to reach the breaking point were determined. Most perforations occurred in the glandular part of the stomach. Gastric perforations in young mice were produced with considerably less pressure and smaller volumes of saline than in older animals. These results may explain previous observations on age differences in ulcer formation and mechanical gastric perforation in the pylorus-ligated mouse. A possible relation between intragastric pressure, circulation and ulceration is discussed.

Effects of Prenatal X Irradiation on the Testes.

B. H. ERSHOFF (*Amer. J. Physiol., April, 1959*) reports that X irradiation during certain stages of prenatal development results in testicular injury and infertility in the male rat. The effects were particularly marked in the offspring of rats irradiated on the eighteenth day of pregnancy. These rats also showed, in addition to testes injury, a significant reduction in seminal vesicle weight. Testicular injury also occurred in the offspring of rats irradiated on the fourteenth day of pregnancy but was less marked than in the eighteen day series. No abnormalities in testicular function or morphology were observed in the offspring of rats irradiated on the tenth day of pregnancy.

British Medical Association.

MEETING OF THE FEDERAL COUNCIL.

A MEETING of the Federal Council of the British Medical Association in Australia was held at British Medical Association House, 88 L'Estrange Terrace, Kelvin Grove, Brisbane, Queensland, on September 26, 27 and 28, 1959.

REPRESENTATIVES.

The following representatives of the Branches were present:

New South Wales: Dr. W. F. Simmons, Dr. A. J. Murray, Dr. R. H. Macdonald, Dr. E. F. Thomson.

Queensland: Dr. E. A. Lee, Dr. D. P. Sapsford.

South Australia: Dr. L. R. Mallen, Dr. C. O. F. Rieger.

Tasmania: Dr. L. N. Gollan, Dr. F. R. Fay.

Victoria: Dr. H. C. Colville, Dr. J. G. Johnson, Dr. T. G. Swinburne.

Western Australia: Dr. C. W. Anderson, Dr. D. M. Clement.

FINANCE.

Financial Statement.

The Honorary Treasurer, Dr. W. F. Simmons, presented the financial statement as at September 26, 1959, and the estimated annual expenditure for 1960. After discussion it was resolved that the contribution of the Branches to the expenses of the Federal Council for the year 1960 should be at the rate of 25s. for each member on the membership list as at January 1, 1960.

Organization Fund.

The Honorary Treasurer presented the financial statement of the Organization Fund for the period ended August 31, 1959. The balance standing to the credit of the fund was £1668 19s. 8d. It was resolved that this money should, if necessary, be used to help defray expenses incurred in the formation of an Australian Medical Association.

Federal Independence Fund.

The Honorary Treasurer presented the financial statement of the Federal Independence Fund for the period ended August 31, 1959. The balance standing to the credit of the fund was £24,694.

Entertainment Fund.

The Honorary Treasurer presented the financial statement for the Entertainment Fund for the period ended August 31, 1959. The balance standing to the credit of the fund was £285.

SECRETARIAT.

The General Secretary referred to the appointment of Dr. Charles James Ross-Smith as Assistant General Secretary of the Federal Council, the appointment having been made at the previous meeting of the Federal Council. Dr. Ross-Smith had commenced duty on June 16, 1959. The President welcomed Dr. Ross-Smith to the meeting.

HENRY SIMPSON NEWLAND PRIZE IN SURGERY.

The Honorary Treasurer presented the financial statement of the Henry Simpson Newland Prize Fund. The balance standing to the credit of the fund was £1070.

It was resolved that the subject of the essay for the prize in 1962 should be "The Modern Management of Inflammatory and Neoplastic Diseases of the Left Colon and Rectum".

MEDICAL OFFICERS' RELIEF FUND (FEDERAL).

The Honorary Treasurer presented the interim report of the trustees of the Medical Officers' Relief Fund (Federal) for six months ended June 30, 1959. The assets of the fund stood at £6544. An amount of £543 had been paid to three beneficiaries during the period under review, the excess of disbursements over income being £435.

FEDERAL MEDICAL WAR RELIEF FUND.

The Honorary Treasurer presented the interim report of the trustees of the Federal Medical War Relief Fund for six months ended June 30, 1959. The total assets of the fund stood at £16,343. The Honorary Treasurer pointed out that the fund was still active and was at present assisting eight beneficiaries who were widows or children of deceased ex-service medical officers. Amounts totalling £472 had been paid to beneficiaries in the period under review, the excess of disbursements over receipts for the six months beings £158.

COMPANIES ACT, 1936.

The General Secretary reported that the necessary returns had been furnished for the Federal Council relating to the *Companies Act*, 1936.

HONOURS.

The General Secretary reported that letters of congratulation had been sent to the following members of the Association on the occasion of the conferring of Birthday Honours on them by Her Majesty the Queen: Major-General W. G. Refshauge, C.B.E.; Dr. L. A. Dey, C.B.E.; Dr. Doris L. Officer, O.B.E.; Dr. Arthur Parkinson, M.B.E.; Dr. Grace J. Cuthbert-Browne, M.B.E.; Dr. C. G. Harper, M.B.E.

MEDICAL PRACTICE IN AUSTRALIA.

The General Secretary reported that he had received some 28 inquiries from overseas practitioners relating to conditions of practice in Australia. He had sent the appropriate reply in each case. He also referred to a request which had been received from the Director of Operations, Philippine Medical Placement Program, Inc., relating to the opportunity for Filipino doctors to obtain internships and residencies in Australian hospitals. The General Secretary said that he had been in touch with the Australian Post-Graduate Federation in Medicine on the subject, and they were referring it to their State branches. Sympathy had been expressed towards the request, and at present he was obtaining further information.

OVERSEAS MEDICAL MEETINGS.

The General Secretary referred to advice that had been received in relation to the following medical meetings overseas: the Forty-Second Medical Congress of the Medical Association of South Africa, to be held at East London from September 27 to October 3, 1959; the First Asian and Oceania Regional Congress of Endocrinology, to be held at Kyoto, Japan, from November 1 to 3, 1959, to which Dr. Ian D. Thomson and his wife, Dr. Maureen Cazalet, of Perth, Western Australia, had been nominated as Federal Council representatives; the Fourth International Goitre Conference of the American Goitre Association, to be held in London from July 5 to 9, 1960; the Sixth International Congress on Diseases of the Chest, to be held in Vienna from August 28 to September 1, 1960, under the sponsorship of the American College of Chest Physicians; the Eighth International Congress of Hæmatology, to be held in Japan from September 4 to 10, 1960, under the auspices of the International Society of Hæmatology.

UNITED NATIONS ASSOCIATION OF AUSTRALIA.

The General Secretary referred to a meeting called by the United Nations Association of Australia on May 12, 1959, to establish a committee to conduct World Refugee Year. The Federal President of the United Nations Association of Australia had invited Dr. H. C. Colville as President of the Federal Council to attend, but as Dr. Colville was not able to do so, the General Secretary had attended to his place. The meeting was so poorly attended that unfortunately no action could be taken.

BRITISH PHARMACOPŒIA COMMISSION.

The General Secretary referred to a letter that he had received from the British Pharmacopœia Commission, inviting the cooperation of the Federal Council in examining the scope of the next edition of the British Pharmacopœia. He said that the matter had been discussed in correspondence with Sir William Morrow, Professor R. H. Thorp and Dr. Byron Stanton, and their comments had been forwarded to the British Pharmacopœia Commission.

OPHTHALMOLOGICAL SOCIETY OF AUSTRALIA (B.M.A.).

The General Secretary referred to a letter that he had received from the Honorary Secretary of the Ophthalmological Society of Australia (B.M.A.) requesting the cooperation of the Federal Council in obtaining publicity for measures designed to obviate "eclipse blindness" in relation to the eclipse of the sun on April 8, 1959. The General Secretary reported that the necessary cooperation had been given.

INQUIRIES ABOUT THE NATIONAL HEALTH SCHEME IN AUSTRALIA.

The General Secretary reported that he had received inquiries seeking information on the National Health Scheme in Australia from Dr. M. J. Lynch, pathologist, of

Sudbury General Hospital, Sudbury, Ontario, Canada, and from Dr. Andres Gomez, Secretary of the Medical Federation of Buenos Aires. In a subsequent letter Dr. Lynch had expressed his appreciation of the information given and also his envy at the very satisfactory health scheme in existence in Australia.

Dispensing Fees.

The General Secretary referred to a letter that had been received from the Western Australian Branch, drawing attention to what it regarded as the unsatisfactory position in regard to the dispensing fees charged by pharmaceutical chemists when dispensing prescribed ethical preparations. Recommendations were made which were referred to the several Branches. In the absence of any strong support for the Western Australian view, no action was taken.

Taxation Allowances for Student Children.

A letter was received from the Queensland Branch, recommending that Federal Council consider making an approach to the Federal Treasurer requesting an extension of the period during which student children were eligible for taxation allowances to cover the period while they were attending university courses. The General Secretary said that the matter had been referred to the various Branches, which, with the exception of the Victorian Branch, all accepted the recommendation. The Federal Council resolved to approach the Federal Treasurer in the terms of the Queensland submission.

Insurance of Medical Practitioners on Duty Flights.

A letter was received from the Queensland Branch, recommending that the Federal Council take up with the Life Offices of Australia the possibility of waiving the standard clause in insurance policies restricting cover to recognized airlines, in respect of duty flights for medical practitioners. The recommendation had been referred to all the Branches and had received unanimous support. The Federal Council resolved to make an appropriate approach to the Life Offices of Australia.

Air Transport of Country Patients to Hospital.

Another letter received from the Queensland Branch requested that the Federal Council approach the various airlines to obtain a reduction in charges for country patients requiring air transport to hospital when the patient occupied a stretcher. It was pointed out that normally with the older type of aircraft, two seats had been removed to provide accommodation for the stretcher, and a charge had been accordingly made for those two seats and one for an attendant when necessary. With new types of aircraft, however, it was understood that four seats had to be removed, with a consequent doubling of the charge. For country patients, particularly in Queensland, that might well entail very heavy charges. The Federal Council supported the view of the Queensland Branch, and resolved to make an approach to the various airlines with a view to obtaining a reduction in charges for air transport for country patients to hospital.

Department of Immigration.

The General Secretary referred to a request that he had received from the Department of Immigration that hospitals be asked to make clear when advertising for overseas graduates for appointments in Australia the limitations imposed on immigration in Australia. This request had been passed on to the appropriate hospital authorities. In a discussion on the matter, Dr. A. E. Lee spoke of the importance of cultivating good relations between Australia and South-East Asian countries and the place of Australia as a training centre for Asian doctors. Further inquiries are to be made into the matter, from the Department of Immigration.

The General Secretary also referred to the new *Migration Act*, No. 62 of 1958, relating to immigration, deportation and emigration, and mentioned a number of its medical aspects.

World Health Organization.

The General Secretary referred to the fact that Sir Harry Wunderly had been appointed the new WHO Tuberculosis Consultant in Malaya. He also referred to the fact that Dr. Lawrence O. Roberts had replaced Dr. J. M. Cruikshank as the WHO area representative for the South Pacific in Sydney.

Fluoridation of Communal Water Supplies.

The General Secretary referred to a letter received from the Vice-President of the Australian Dental Association, requesting reaffirmation of the Federal Council's policy on fluoridation of communal water supply. He said that he had replied advising the Australian Dental Association of the resolution of the Federal Council relating to the matter, and of the fact that the resolution had not been rescinded.

General Anæsthesia in Dental Practice.

A letter was received from the Queensland Branch, which had received representations from the Queensland Branch of the Australian Dental Association regarding the difficult experiences of dentists, particularly in country towns, where medical practitioners refused to give anything but open anæsthesia for dental operations. The Queensland Branch had said that the matter had been brought to the attention of the members of the Branch and the hope expressed that the practice of giving either open anæsthesia, or other forms of general anæsthesia in which packing of the pharynx was not possible, would be eliminated. A request had also been made for information on the extent of the problem in Australia and of any action taken in the matter by other States. The General Secretary reported that the necessary information was being obtained from the Branches to be sent on to the Queensland Branch.

Titling of Dentists in Tasmania as "Doctor".

A letter was received from the Tasmanian Branch in relation to a proposal that dentists in Tasmania should assume the title "doctor" or "dental doctor", to differentiate them from dental mechanics and others who were not fully qualified, but who were allowed to be registered as dentists in Tasmania. It appeared that under the system employed by Tasmania dentists, not holding a doctorate, could legally entitle themselves "doctor". After discussion and in response to certain specific questions asked by the Tasmanian Branch Council, the Federal Council expressed its disapproval of dentists, other than those holding a doctorate degree, titling themselves "doctor" or "dental doctor", and recommended to the Tasmanian Branch that it request the Tasmanian Minister for Health to reintroduce into the Tasmanian *Medical Practitioners' Act* the section omitted when the Act was consolidated in 1957 dealing with the use of the title "doctor" by medical practitioners only.

International Medical Research.

The General Secretary referred to a memorandum and booklet on International Medical Research which had been received from Senator H. H. Humphrey, who was chairman of a subcommittee of the United States relating to international medical research. The General Secretary said that the information had been passed on to the Branches.

Postal Transmission of Restricted Drugs.

At the meeting of the Federal Council on March 21, 1959, a resolution was passed that an approach be made to the Postmaster-General's Department with regard to the dangers of sending restricted drugs through the post in unsealed envelopes, and that he be asked to have this practice prevented. The General Secretary reported that the approach had been made to the Postmaster-General's Department and the matter was receiving attention. It was pointed out in the discussion that the amended postal regulations, as a result of which there was no reduction in postal rates for unsealed envelopes, would probably largely obviate the problem.

Telephone Directories.

At the meeting of the Federal Council in March, 1959, it was decided that representation be made to the Postmaster-General's Department asking that consideration be given to publishing each year a supplementary list of new and altered telephone numbers recorded between July 1 and December 1, as the long period of lag for medical practitioners to get new names in the telephone directory caused inconvenience to the public. The General Secretary reported that in a reply from the Postmaster-General it had been explained that Sydney and Melbourne telephone directories would be published as separate alphabetical and classified books commencing with the 1959-60 issue. The next issue would be the classified directory in November, 1959, followed by the alphabetical list in April or May, 1960. That arrangement would mean that members of the medical profession who commenced practice after the issue of the directory would be able to obtain a listing within a period of about six months, and, although different in principle from separate supplements as suggested, it would enable the objective sought to be met. It was also pointed out that, in view of the fact that the alphabetical section of the 1958 directory would remain effective until April or May, 1960, the 1959 classified directory would contain a white page supplement, showing all new and altered numbers allotted to subscribers since

the current publication had gone to press. In a subsequent discussion it was pointed out that a new telephone directory had just been issued in Queensland.

AUSTRALIAN AND NEW ZEALAND ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Dr. C. W. Anderson submitted a report on the thirty-fourth Congress of the Australian and New Zealand Association for the Advancement of Science held in Perth from August 24 to 28, 1959, at which he had been the representative of the Federal Council.

SUGGESTED VISIT TO RUSSIA BY BRITISH MEDICAL ASSOCIATION REPRESENTATIVES.

A letter was received from Dr. George Palmer, of the Australian Migration Mission, Vienna, Austria, offering to be among representatives visiting Russia if any decision was made by representatives of the British Medical Association in Australia. Dr. Palmer also offered to provide any facilities that he could to assist delegates passing through. The General Secretary stated that he had advised Dr. Palmer that nothing definite had been done in the matter of arranging such a visit.

CONFEDERATION OF MEDICAL ASSOCIATIONS OF ASIA AND OCEANIA.

A report was received from Dr. R. H. Nattrass, who had represented the Federal Council at the first meeting of the Confederation of Medical Associations of Asia and Oceania held in Tokyo from March 31 to April 5, 1959. Dr. Nattrass also reported on the fifteenth general assembly of the Japan Medical Congress, which he had attended as the representative of the Federal Council from April 1 to 5, 1959.

AUSTRALIAN ADVISORY COUNCIL FOR THE PHYSICALLY HANDICAPPED.

The General Secretary reported that Dr. Leigh T. Wedlick had accepted nomination as the Federal Council representative on the selection panel to choose candidates for the Frank H. Rowe Memorial Fellowship for Post-graduate Training in Physical Medicine and Rehabilitation, in accordance with the decision of the Federal Council at its meeting in March, 1959.

NATIONAL MARRIAGE GUIDANCE COUNCIL OF AUSTRALIA.

The General Secretary referred to an invitation that had been received for the Federal Council to send an observer to the annual meeting and conference of the National Marriage Guidance Council of Australia, to be held in Brisbane from September 16 to 29, 1959. Professor D. Gordon had been nominated as the representative of the Federal Council.

AUSTRALASIAN MEDICAL PUBLISHING COMPANY LIMITED.

The General Secretary referred to notices that he had received of the meeting of the Directors of the Australasian Medical Publishing Company Limited to be held on September 29, 1959, and to the notice of the forty-sixth ordinary general meeting of the company to be held on October 14, 1959.

FORMATION OF A NEW MEDICAL ASSOCIATION OF AUSTRALIA.

At the meeting of the Federal Council in March, 1959, it was resolved that the necessary steps be taken to investigate the possibility of the formation of a Medical Association of Australia. The General Secretary reported that subsequently he had had correspondence with the Medical Association of South Africa, the Canadian Medical Association and the American Medical Association and had obtained details of their constitutions. These details were presented in a document to the Federal Council. The matter had also been discussed further with the President, Dr. H. C. Colville; and subsequently, at the meeting of the executive officers of the Federal Council on September 9, 1959, the General Secretary had been asked to prepare a short statement on the pros and cons of the matter. The statement was made available to the members of the Federal Council and was approved, appreciation being expressed of the clarity and practical usefulness of the document.

In discussing the question the President said that there was every indication that the move should be made. He had recently returned from a visit overseas, and there appeared to be no objection whatever to it in Great Britain. On the contrary, members of the Parent Body seemed to favour it. He considered it right that the Branches be consulted before anything more was done, and suggested that a resolution of a general character be passed and that it be referred to the Branches. Dr. Murray said that he had no doubt that the time had come to form such an association in Australia, and that there was a need for a unique constitution in order to ensure unity of the whole profession. Dr. Lee supported the move and advocated the use of the term Australian Medical Association, rather than Medical Association of Australia, and with this there appeared to be general agreement. The Federal Council then passed the following resolution:

> That in the opinion of the Federal Council the time is now opportune to proceed with the formation of an Australian Medical Association, independent of, but affiliated with, the British Medical Association.

It was further resolved that the opinion of the Federal Council be forwarded to the Branches with the request that the views of members be obtained, and that the executive officers be empowered, prior to the next meeting of the Federal Council, to formulate detailed proposals concerning the constitution and machinery of an Australian Medical Association.

VISIT OF THE MINISTER FOR HEALTH.

During the course of the meeting a visit was paid by the Minister for Health, Dr. Donald A. Cameron, and a full and frank discussion took place on a number of aspects of the proposed legislation for pharmaceutical benefits and other matters.

NATIONAL HEALTH SERVICE.

Future of the National Health Service.

Dr. A. E. Lee reported on meetings that he had attended with the Minister for Health, in company with other leading personalities in the medical benefits field, in relation to proposed changes in the National Health Service. Dr. Lee also reported on meetings which had been held of the Commonwealth Health Insurance Council, on which he was the representative of the Federal Council. He said that the Commonwealth Health Insurance Council had now become a very active body. As a result of the discussions the Government had largely accepted the Federal Council's recommendations in relation to "special accounts" and payments of hospital benefits to patients with an acute illness even though they might not be in an approved hospital. With regard to anomalies in the medical benefits schedules, which the Government had decided to revise, the Federal Council's recommendations had been used as the basis of revision and a fair number of the recommendations were to be adopted almost unchanged.

However, the Federal Council was of the opinion that there were still important anomalies existing in the schedule of benefits, and requested that the Minister be approached and asked to give further consideration to the correction of those anomalies. It was also resolved that, in the event of the Minister for Health being unwilling to further amend the Commonwealth Schedule of Benefits under the Medical Benefits Scheme, it be represented to him that the further correction of anomalies become a matter for the registered Medical Benefits organizations, and that his department should not disapprove of moves made by those organizations to achieve the purpose.

Australian Labour Party: National Health Service Policy.

The General Secretary drew attention to a statement which had appeared in *The Sydney Morning Herald* of May 15, 1959, referring to the National Health Service policy of the Australian Labour Party. Amongst other things it provided for a salaried general practitioner service on a per-capita basis, repeal of the necessity to belong to a registered society in order to participate in medical benefits and free hospital treatment.

Pensioner Medical Service.

Voucher Form.

At a meeting of the Federal Council in March, 1959, it was decided to recommend to the Minister for Health that the pensioner's address be deleted from the pensioner medical service voucher form. The General Secretary reported that the Minister had replied, regretting that he was unable to accede to the request and pointing out that experience had shown that in many instances the address shown on the voucher was the only means of identifying the pensioner or leading to his identification. In the circumstances it was held that it was essential to the efficient administration of the pensioner medical service that the address of the pensioner be shown on the voucher form, except that, as already agreed, the address of the pensioner need be shown on one voucher only when a number of vouchers were submitted in respect of one patient in any claim.

Definition of Pensioner Medical Service.

A letter was received from the Queensland Branch, recommending that the Federal Council approach the Commonwealth Health Department with a request that it define clearly the limits of the medical service within the Pensioner Medical Service. The General Secretary reported that the Queensland Branch request had been referred to other Branches and had received no support. The Federal Council took no further action in the matter.

Pharmaceutical Benefits.

Phenylbutazone. A letter was received from the New South Wales Branch, forwarding a complaint from the Australian Rheumatism Association (New South Wales) against the deletion of phenylbutazone from the list of pharmaceutical benefits. A similar request was received from the Victorian Branch. However, on information produced at the meeting, it was apparent that the decision to make this deletion was made after careful consideration of the reports of leading international therapeutists, and no change in the Government's decision is likely.

"Rastinon." A communication was received from the Director-General of Health, advising of the availability of "Rastinon" tablets as a pharmaceutical benefit for pensioners.

Miotic Eye Drops. A letter was received from the Ophthalmological Society of Australia (B.M.A.), requesting the Federal Council that representations should be made to the Federal Government with regard to the alteration of prescribing limits of miotic eye drops from 2 grammes and 6 repeats to half an ounce and no repeats. The General Secretary reported that the matter had been referred to the Director-General of Health, but no reply had yet been received.

General Pharmaceutical Benefits.

Additional Benefits.

The General Secretary referred to a number of requests that had been received from the Branches recommending additions and changes to the list of general pharmaceutical benefits. He said that in each case the requests had been sent on to the Minister.

Extension of Pharmaceutical Benefits.

A discussion took place on the question of the extension of pharmaceutical benefits as outlined in the budget speech of the Federal Treasurer delivered in August, 1959, and as amplified in a Press statement prepared by the Minister for Health. It appeared that the essential features of the new scheme were that the range of drugs to be made available as pharmaceutical benefits should be broadened to include most of those at present made available under the Pensioner Medical Service, in addition to the drugs originally classed as costly, life-saving and disease-preventing, and that in addition a charge of 5s. should be made for each item supplied on prescription. A formulary on the lines of that of the Pensioner Medical Service would be the basis of the scheme, but the practitioner would not be obliged to limit himself to this, the scope being broadly that of the British Pharmacopœia. The payment of 5s. would be on a basis that the patient would pay up to the first 5s. charged for each item.

It appeared from the discussion that there was some difference of opinion between the States on the wisdom or otherwise of widening the scope of the pharmaceutical benefits, but that there was general agreement that the medical profession should have been consulted in some way before the proposal was introduced. It was appreciated that the mounting cost of pharmaceutical benefits was creating a difficulty for the Government, and the desire was expressed to contribute in some constructive way to the meeting of this difficulty; but it was felt that the method proposed by the Government was not the desirable way of doing so. It was finally resolved, following the lines of a recommendation from the New South Wales Branch, that the Federal Council deplored the action of the Government in widening the scope of pharmaceutical benefits without reference to the profession and took strong exception to the scheme as interfering with the profession's freedom.

In a further resolution, it was recorded that the Federal Council was anxious to assist the Government in finding an alternative method by which the cost of the pharmaceutical benefits could be stabilized, and it was decided that the Minister for Health should be asked to defer the implementation of the amendments of the *Pharmaceutical Benefits Act* pending examination of the factors concerning the cost of the present scheme, and that it should be suggested to the Minister that a committee should be set up to examine the problem.

These particular resolutions were presented to the Minister at the conference held with him on September 27, and at the same time Federal Council members enlarged upon the viewpoints contained in the resolutions. The Minister, in replying to the resolutions, as read by the President, and to the various statements made by Council members, stated that he found it difficult to understand how this new plan was going to interfere with the freedom of the profession in any way whatsoever. With regard to the matter of prior consultation with the profession, the Minister said that this was impracticable, as Governments would never really get anywhere if prior consultation with all interested parties was made before new schemes were announced.

Concerning the matter of free prescribing, just over 50% of all prescriptions written were now free, and in practical terms, if the present scheme went on, it must be anticipated that there would be a natural increase in this percentage of "free" prescribing in future years until practically all prescribing would be free.

Concerning the resolution referring to deferral of the date of implementation of the Scheme, the Minister stated that it was impossible to accede to this request and that the Bill must be presented before Parliament in the very near future. Further, concerning the resolution of Federal Council on the formation of a committee to advise the Minister, Dr. Cameron said that he did not think the formation of a committee would be beneficial. Finally, he stressed the point that the new list being proposed by the Government would be virtually unlimited and that doctors would have no cause to be restricted in their prescribing.

After the conclusion of the conference with the Minister, Federal Council considered the extension of pharmaceutical benefits further in view of the discussion with the Minister, and it was recorded in a resolution that the Federal Council maintained the principle that absolute freedom of prescribing by the medical profession was vital, and that the Federal Council should strongly request the Minister for Health to amend his proposal for the Pharmaceutical Benefits Scheme so that all prescriptions came into the scheme except those contained in the list to be drawn up by the Pharmaceutical Benefits Advisory Committee. It was also decided that a report of the conference with the Minister, together with the decisions of the Federal Council in regard to the proposed extensions of the Pharmaceutical Benefits Scheme, be referred to the Branches for urgent consideration.

Notes to Medical Practitioners.

A letter was received from the Western Australian Branch in which it was recommended that the Federal Council should request the Federal Government (i) to ensure that the notes for medical practitioners relating to pharmaceutical benefits should be issued in ample time to allow for the full examination of the regulations concerned, (ii) to standardize as far as possible maximum quantities and repeats, and (iii) to list, in the explanatory circular, proprietary names in addition to the British Pharmacopœia nomenclature so that doctors might more easily understand the items to be changed. After discussion and consideration of the opinions of the other Branches a resolution was adopted in the terms of the Western Australian suggestion.

Medical Services Committees of Inquiry.

The General Secretary referred to the reprimand of three medical practitioners, notice of which had been published in the *Commonwealth Government Gazette*, and also to several changes in the constitution of the State committees of inquiry.

Medical Benefits.

At a meeting of the Federal Council in March, 1959, it was resolved to request the Minister for Health to constitute a medical benefits advisory committee along lines suggested by the Federal Council. A reply was received from the Minister in which he expressed the opinion that, although the Pharmaceutical Benefits Advisory Committee had been of very considerable assistance to the Commonwealth, he considered that the differences between the pharmaceutical and medical benefits schemes were such that a committee such as was suggested relating to medical benefits would not provide the same assistance. He said that the Government fully appreciated the valuable advice available in relation to the operation of the Medical Benefits Scheme and had sought to take advantage of that advice by the establishment of the Commonwealth Health Insurance Council. Its function was to advise the Commonwealth on matters relating to the medical benefits and additional

hospital benefit schemes. In the circumstances he felt that it was unnecessary to establish a medical benefits advisory committee along the lines suggested.

Anomalies in Schedule of Medical Benefits.

Subsequent to the visit of the Minister and the obtaining of his assurance that he would be prepared to consider further a very limited number of existing gross anomalies in the schedule of medical benefits, as long as the correction of such anomalies would not involve a great deal of arithmetic, the Committee on Anomalies met and compiled a short list of such gross anomalies for the Minister's consideration. The list was approved by the Federal Council for forwarding to the Minister.

Definition of Specialist Surgeon.

A letter was received from the President of the Royal Australasian College of Surgeons, setting out the definition of the term "specialist surgeon" adopted by the College and advising the view of the College that such specialist surgeons should be recorded on a national register of approved specialists. The definition was as follows: "A specialist surgeon is a legally qualified medical practitioner who is either a Fellow of the Royal Australasian College of Surgeons or is in the possession of a qualification recognized by that College." It was further advised that for a limited period specialist qualifications of medical practitioners based on practical experience rather than academic qualifications should be the subject of individual consideration for admission to the register of approved specialists.

After discussion the Federal Council resolved that it should confirm the Federal Council definition of specialist adopted in 1954 and subsequently amended in 1957 (see THE MEDICAL JOURNAL OF AUSTRALIA, October 16, 1954, page 645, and April 6, 1957, page 478). It was also decided that the Royal Australasian College of Surgeons should be invited to confer with representatives of the Federal Council in an endeavour to arrive at a definition of a specialist surgeon mutually satisfactory to both parties, and that the register proposed by the College be discussed. In the event of the conference being agreed to, the representatives of the Federal Council were to be Dr. H. C. Colville, Dr. J. G. Johnson and Dr. T. G. Swinburne.

In another letter the President of the College expressed the concern of the College for a matter of principle—namely, that in rebates to patients for operative procedures there was no differential recognition for the services of qualified specialist surgeons, and it was considered that the principle of differential recognition of services in regard to specialist consultations should be extended to the more important matter of surgical procedures. The President of the College stated in his letter that the College Council had decided to pursue the matter further and requested that the College be given representation on any discussions on the subject with the Minister for Health.

The Federal Council considered this request and decided that as the Minister for Health was scheduled to confer with the Council on the following day, the opportunity should be taken to invite a spokesman for the College to join the conference with the Minister and present the views of the College. Professor N. G. Sutton accepted the invitation on behalf of the College and accordingly expounded the case for the establishment of a separate Schedule of Benefits for specialist surgeons to the Minister for Health. The President of the Federal Council, however, at the outset made it clear that in such discussions with the Minister the Federal Council was merely acting as a liaison in line with its policy of presenting to the Federal Government matters of medico-political concern to medical colleges and associations. The Minister for Health, in replying to Professor Sutton, stated that at the present stage the Federal Government could do nothing in this particular field.

Committees of Inquiry.

Reference was made to a letter from the Minister for Health, outlining the limited powers of the Committees of Inquiry in the Medical and Hospital Benefits Schemes and requesting further suggestions from the Federal Council. It was resolved to ask the Minister for Health to investigate the legal position in relation to such committees of inquiry and their punitive powers.

Colposcopic Examination.

At its meeting in March, 1959, the Federal Council resolved to request the Minister for Health to withdraw the present item D71, colposcopic examination, and to replace it with an item "Examination of the uterine cervix by a magnifying colposcope of the Hinselmann type or similar instrument". In a reply the Director-General of Health said that it had always been the intention to define the items concerned in the terms presented by the Federal Council. However, action would be taken to further revise the wording when the examination was incorporated into the schedules of the Act.

Electro-Convulsive Therapy and Intravenous Anæsthesia.

At its meeting in March, 1959, in response to an inquiry by the Commonwealth Director-General of Health and after consultation with the Branches, the Federal Council expressed the opinion that it was good practice for a psychiatrist to give electro-convulsive therapy whilst at the same time administering an anæsthetic. Subsequently the decision was criticized in a letter from the Australian Society of Anæsthetists published in THE MEDICAL JOURNAL OF AUSTRALIA. A letter was also received from the Tasmanian Branch, asking whether the Federal Council had obtained any opinion from the Faculty of Anæsthetists of the Royal Australasian College of Surgeons or from the Australian Society of Anæsthetists; and the New South Wales Branch forwarded a letter from the New South Wales Medical Defence Union, in which it was stated that the Council of the Union viewed the statement of the Federal Council with apprehension and suggested that the Federal Council be requested to give further consideration to the matter. The Council of the New South Wales Branch asked that the matter be further considered. The matter had been referred to the Branches for further consideration.

After discussion and consideration of the views of the Branches, it was moved by Dr. A. J. Murray that the previous resolution of the Federal Council be rescinded. The motion was defeated.

Maxillary Antrum, Proof Puncture and Lavage.

Reference was made to a complaint from the Oto-Laryngological Society of Australia (B.M.A.) recording its dissatisfaction at the interpretation of item 126, maxillary antrum, proof puncture of, and item 127, maxillary antrum, lavage of, by the Medical Benefits Fund of Australia through its Chief Assessor. The General Secretary advised that the matter had now been satisfactorily adjusted.

Services Rendered on Behalf of Medical Practitioners.

At the meeting of the Federal Council in March, 1959, it was resolved that a further approach be made to the Minister for Health on the question of payment for a benefit when a patient received a service from a person other than a legally qualified medical practitioner and that a copy of the opinion of the Federal Council's legal adviser on the matter be forwarded to the Minister. In a subsequent letter, the College of Pathologists of Australia emphasized their adherence to the following principles: (i) that pathology laboratories should be supervised by medical personnel; (ii) that pathology service was a medical service and the function of a doctor; (iii) that fees for medical service should not be payable to non-medical personnel. The matter was referred to the Minister for Health, but in a reply he expressed the view that the present arrangement should not be disturbed.

The Federal Council resolved to express to the Minister its strongest condemnation of benefits being payable to a patient for services rendered by a person who was not a legally qualified medical practitioner and who was not employed by a legally qualified medical practitioner, and to ask that the *National Health Act* be amended to preclude such payments.

Payment for Special Ancillary Services.

A letter was received from the New South Wales Branch, forwarding a request from the British Psychology Society (Australian Branch) asking for the attitude of the British Medical Association towards an application by the Society for the Commonwealth authorities to have psychologists' fees included in the schedule of fees eligible for Commonwealth Medical Benefits. After discussion it was resolved that the proposal of the British Psychological Society (Australian Branch) be not approved.

Direct Payment to Doctors by Benefit Organizations.

A letter was received from the Victorian Branch, recommending to the Federal Council that it requests the Minister for Health to amend the *National Health Act* so that a medical practitioner's consent in writing must be obtained before payment of Commonwealth or Fund benefit, in whole or in part, could be made by a benefit organization direct to the practitioner concerned. After consideration of the

views of the Branches and of the legal advice, it was decided to take no further action in the matter.

The Payment of Benefits Services Rendered by Chiropractors.

A letter was received from the Tasmanian Branch, advising that one benefit organization in Tasmania paid benefits for services by chiropractors, and recommending that the Federal Minister for Health be approached to have the practice discontinued. The Federal Council resolved to ask the Minister to take action in accordance with the terms suggested by the Tasmanian Branch.

THE RIGHT OF PRIVATE PRACTICE FOR SALARIED PATHOLOGISTS.

At the meeting of the Federal Council in March, 1959, approval was given to the submission of the College of Pathologists of Australia that it was wrong in principle that a hospital should collect private fees in which a pathologist did not share, and the view was expressed that where services were carried out for a private patient and a fee was charged, the account should be rendered by the doctor, who should refund the agreed portion of the fee to the hospital. Subsequently the New South Wales Branch advised the Federal Council that its Council was unable to accept the decision of Federal Council, and requested that the matter be given further consideration. It gave the following reasons for its inability to accept the Federal Council decision: (i) full-time pathologists should be paid for their work and should not need to acquire further financial assistance from their private work; (ii) private work was done in hospital time with the aid of hospital technicians and equipment; (iii) the salaried pathologist was not involved in any overhead expense. After further discussion, the Federal Council decided not to alter its previous decision.

HOSPITAL ADMINISTRATION.

A letter was received from the South Australian Branch, in which it was stated that, as the result of certain difficulties which had recently arisen in South Australia, the Council of the Branch had been concerned with the question of hospital administration as it confronted the organized medical profession. The advice of the Federal Council was requested on the future investigation of the problem, on behalf of the profession of Australia. The General Secretary referred to information that had been obtained from the School of Hospital Administration in the University of New South Wales.

The Federal Council discussed the question, and in a resolution expressed the opinion that as far as possible the chief executive officer of larger hospitals should be a medical graduate.

VACCINATION AGAINST POLIOMYELITIS.

At the meeting of the Federal Council in March, 1959, it was resolved to make a further request to the Minister for Health pointing out that the Federal Council believed that immunization of the community was being retarded by the failure to make Salk vaccine available to general practitioners. The General Secretary reported that two submissions had been made to the Minister in the subsequent period, but he had been unwilling to agree to the suggestion of the Federal Council. However, the Minister had given his assurance that the matter would be given consideration and be referred to the National Health and Medical Research Council for a technical recommendation.

AUSTRALIAN COLLEGE OF GENERAL PRACTITIONERS.

The General Secretary referred to a letter from the Australian Post-Graduate Federation in Medicine, forwarding a copy of a letter addressed to the College of General Practitioners proposing that a meeting be called by the Federal Council between the President of the Federation, the President of the Royal Australasian College of Surgeons, and the Honorary Secretary of the College of General Practitioners. The Royal Australasian College of Surgeons had advised that it was doubtful if the College had anything further to contribute to such a conference convened to consider the subject. However, Dr. C. O. F. Rieger, as a Federal Council representative in South Australia, was requested to convene a "round the table" conference between representatives of the Post-Graduate Federation and the College of General Practitioners and to invite the President of the Royal Australasian College of Surgeons to sit in on the meetings. The Federal Council considered a report of the conference submitted by Dr. Rieger, and resolved to inform Branch Councils that it approved of the formation in each State of committees composed by representatives of the British Medical Association, the College of General Practitioners and the Australian Post-Graduate Federation in Medicine to consider the establishment of facilities for the surgical training of general practitioners.

COMPANY FORMATION.

The General Secretary referred to an item in the monthly paper of the Victorian Branch of June, 1959, quoting the Victorian Crown Solicitor's opinion relating to company formation by medical practitioners in Victoria.

A letter was received from the New South Wales Branch, advising that a proposal to institute a by-law in the Branch in accordance with the resolution of the Federal Council adopted in February, 1958, had been rejected by a large majority of members present at an extraordinary general meeting on May 14, 1959.

BRITISH MEDICAL ASSOCIATION.

Overseas Rate of Subscription.

It was recorded that, as the result of a resolution of the Annual Representative Meeting of the British Medical Association held in Edinburgh in July, 1959, the overseas rate of subscription to the Association had been raised by one-half guinea sterling. The total increase in Australian currency amounted to £1 1s. 4d.

Annual Meeting, 1961, Auckland, New Zealand.

A letter was received from the General Secretary of the New Zealand Branch of the British Medical Association, advising that the 1961 annual meeting of the British Medical Association would be held in Auckland from February 6 to 10, 1961. The General Secretary stated that the dates had subsequently been amended to February 4 to 10, 1961.

The President, Dr. H. C. Colville, advised that he had extended an invitation to Dr. Wand, the Chairman of the British Medical Association, and to officials and members of the Association travelling to New Zealand for the meeting in 1961, to visit Australia. The Federal Council approved the President's action.

BRITISH COMMONWEALTH MEDICAL CONFERENCE.

A report was received from Dr. H. C. Colville of the fifth British Commonwealth Medical Conference, which he had attended in London in July, 1959, and also the official report of the conference from the Secretary-Treasurer. Copies were also received of the two papers read at the conference, one on "Post-Graduate Medical Education", by Dr. R. A. Pallister, and the other on "Relations between the Medical Profession and the Public", by John Pringle.

The Federal Council considered a *questionnaire* accompanying the official report of the conference and relating to the future of the conference. A discussion took place on the question of the usefulness of the conference. Although it was not suggested that the conference should be ceased, it was felt that an effort should be made to improve it and to increase its usefulness.

THE NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL.

The General Secretary reported that Dr. W. F. Simmons, the Federal Council's representative, had forwarded his personal report on the forty-second session of the National Health and Medical Research Council held in Adelaide from May 21 to 22, 1959. The Federal Council expressed its thanks to Dr. Simmons for his valuable report.

It also received from Dr. Simmons a copy of the report of the Committee for Epidemiology and Infectious Disease (see THE MEDICAL JOURNAL OF AUSTRALIA, September 5, 1959, page 337).

WORLD MEDICAL ASSOCIATION.

Thirteenth General Assembly.

The General Secretary reprted that the Australian delegation to the thirteenth General Assembly of the World Medical Association held in Montreal, Canada, September 7 to 12, 1959, had consisted of Sir Earle Page and Dr. Hyam Owen as delegates, with Dr. H. S. Patterson as alternate delegate.

Council Sessions.

The General Secretary presented a report on the expenses of the thirty-fifth council session of the World Medical Association held in Sydney from March 25 to April 1, 1959. He also referred to letters of appreciation received from the World Medical Association for hospitality received.

Dr. L. R. Mallen reported on the Council sessions just held at Montreal.

Supporting Committee in Australia.

The General Secretary reported that the Australian supporting committee of the World Medical Association had a credit balance of £4075. It was resolved that the annual subscription to the World Medical Association should be paid out of the general funds of the Federal Council, and that, with a view to assisting the World Medical Association in promoting its objects, supporting committees be continued until such time as the Australian Medical Association was formed, when the matter should be reconsidered.

Universal Fingerprinting of Medical Practitioners.

At the meeting of the Federal Council in March, 1959, it was resolved to seek the views of the World Medical Association on the universal fingerprinting of medical practitioners. It was reported that the matter had been referred by the World Medical Association to the various national medical associations to institute such action as they thought fit on a voluntary basis.

Second World Conference on Medical Education.

Reference was made to the Second World Conference on Medical Education held in Chicago from August 30 to September 4, 1959. Dr. Mallen reported that the conference had been a great success. It had been attended by 800 delegates from 150 universities and from 66 countries.

It was resolved that the Federal Council should contribute a second sum of £250 towards the cost of the conference. This was in addition to the sum of £250 previously made available.

International Code of Medical Ethics in Wartime: Protected Emblem for Civilian Doctors and Medical Units.

A letter was received from the Secretary-General of the World Medical Association, requesting a progress report of the recognition by the Australian Government of the protective emblem for civilian doctors and medical units. The General Secretary reported correspondence with Dr. L. R. Mallen and with the Chairman of the Australian Red Cross Society in relation to the matter.

FUND FOR PUBLICATION OF MONOGRAPHS.

The Honorary Treasurer presented the financial statement to date for the Federal Council Fund for the Publication of Monographs. The credit balance of the fund stood at £2304. It was reported that the second monograph, which was on the subject of "Gynæcomastia", by Dr. Peter F. Hall of Sydney, had been printed and was now ready for distribution. A letter was received from Dr. Peter F. Hall expressing thanks for the acceptance and publication of the monograph.

Dr. Angus Murray moved that the title of the Federal Council Monograph Fund be altered to the "Mervyn Archdall Medical Monograph Fund". He pointed out that Dr. Mervyn Archdall had been responsible for bringing the fund into being and had indeed been responsible for collecting most of the money that had gone towards it. The motion was carried unanimously. It was further resolved that the question of a further appeal for contributions to the Mervyn Archdall Medical Monograph Fund be left in the hands of the trustees with power to act.

REPATRIATION DEPARTMENT.

Visiting Medical Officers.

The General Secretary referred to a letter from the Minister for Repatriation, forwarding comments on the conference held in October, 1958, on the question of conditions of service of visiting medical officers to Repatriation Department hospitals, together with suggested composition and terms of reference of a Repatriation Central Medical Advisory Committee. He reported that at a meeting of the executive officers of the Federal Council held on June 9, 1959, Dr. H. C. Colville had been appointed the representative of the Federal Council on the committee. The General Secretary also referred to correspondence with the Royal Australasian College of Surgeons and The Royal Australasian College of Physicians requesting their cooperation in establishing a committee. Both Colleges had subsequently advised their willingness to cooperate and had appointed nominees. The committee as finally constituted consisted of five members: Dr. W. E. E. Langford, Principal Medical Officer of the Repatriation Department; Dr. L. C. E. Lindon, President of the Royal Australasian College of Surgeons; Professor J. G. Hayden, President of The Royal Australasian College of Physicians; Dr. H. C. Colville, President of the Federal Council of the British Medical Association in Australia; Sir Albert Coates, appointed by the Minister for Repatriation.

Radiological and Pathological Reports on Repatriation Patients.

A letter was received from the Queensland Branch, pointing out that at present it was necessary for local medical officers to obtain consent from the State Repatriation Department before referring a repatriation patient for radiological and pathological examinations. It was recommended to the Federal Council that representations be made to the Repatriation Department with a view to its not being incumbent on local medical officers to obtain such permission when they considered the examinations were necessary. The Federal Council resolved to make representations to the Repatriation Department in terms of the Queensland suggestion, on the understanding that it applied where Repatriation Department facilities were not available.

Medical Benefits for Widows, Widowed Mothers and Orphans of Deceased Ex-Service Men.

A letter was received from the Chairman of the Repatriation Commission, advising of extension of treatment benefits available for widows, children and certain other dependants of ex-service men, as outlined in the Federal Treasury Budget Speech of August, 1959. The letter stated that all local medical officers and medical practitioners who had agreed to treat war widows and dependants had been notified of the new benefits available.

DEPARTMENT OF SOCIAL SERVICES.

At a meeting of the Federal Council in March, 1959, it was resolved to make a further approach to the Department of Social Services, making strong representations that the fees payable to general practitioners for services rendered on behalf of the department should be three guineas for the first hour and one guinea for each subsequent half-hour or part thereof. The General Secretary advised that the Director-General of Social Services had stated that it was impossible for the department to accede to the Federal Council's request, and that existing rates would continue to apply. Subsequently the Victorian Branch had requested that further representation be made for an increase in concessional fees paid to the general practitioner by the department, particularly in view of the recent basic wage increase and the increases made in parliamentary salaries. After discussion the Federal Council resolved that a further approach be made to the Department of Social Services, asking that the fees payable to general practitioners for services rendered on behalf of the department should be three guineas for the first hour and one guinea for each subsequent half-hour or part thereof.

Provision of Artificial Limbs.

At a meeting of the Federal Council in March, 1959, it was decided to recommend to the Department of Social Services that persons who were undergoing rehabilitation training, but who were ineligible for sickness pension benefits, should be able to purchase their artificial limbs and appliances on a hire-purchase basis, financed by the Commonwealth Government. The General Secretary reported that in a letter from the Director-General of Social Services he had made a detailed statement on the position, and had said that he was unable to accede to the Federal Council's recommendation.

REHABILITATION.

At a meeting of the Federal Council in March, 1959, it was decided to inquire from the Minister for Health as to the policy of the Government on rehabilitation in relation to the Federal Council's submission in 1958 to the Departments of Health, Social Services, and Labour and National Service. In his reply, the Minister for Health had advised that it was unlikely that the Commonwealth Government would move into the area concerned in the near future. In a subsequent letter from the Western Australian Branch, it was recommended that the Federal Council should take up the question by deputation to the Prime Minister. After discussion, the Federal Council decided to defer the matter until its next meeting.

Rehabilitation and Provision of Artificial Limbs and Appliances for Amputees.

The General Secretary referred to a letter from the Prime Minister, in which he forwarded a copy of a letter to the National Secretary of the R.S.S.A.I.L.A. in answer to a

deputation which had waited on him in May, 1956, on the subject of rehabilitation and the provision of artificial limbs and appliances for the amputee population of Australia. The Federal Council resolved to advise the Chairman of the Repatriation Commission that the Federal Council was of the opinion that the subject of the treatment of ex-service amputees was a suitable matter for consideration by the Central Medical Advisory Committee.

Australian Council of Social Services.

The General Secretary advised that the Australian Social Welfare Council had changed its name to the Australian Council of Social Service with effect from June, 1959. A letter was received from the chairman of the Council forwarding a copy of the constitution of the Council and requesting nomination of a Federal Council representative. The Federal Council nominated Dr. J. G. Hunter as its representative on the Council.

Dr. Hunter reported that the annual general meeting of the Australian Council of Social Service had been held in Canberra on August 28, 1959, and that he had been appointed Deputy Chairman of the Council. The chairman was Professor Morven Brown, of the University of New South Wales. It was advised that the first national conference arranged by the Council was to be held in Melbourne in May, 1960.

Reference was made to a research project into the social problems of widows and dependent children in the Australian community to be carried out by the Council of Scial Service of New South Wales. A request was received for contributions to the project and for ideas on its direction. The Federal Council resolved to contribute £25 towards the cost of the project.

Australian Road Safety Council.

A discussion took place on the matter of the Senate Select Committee on Road Safety and in particular on the question of blood tests for intoxication. The General Secretary pointed out that the Federal Council, in a communication to the Australian Road Safety Council in 1956, had endorsed the soundness of scientific tests for intoxication, and had urged that the need for increased facilities for the carrying out of those tests be brought to the attention of appropriate authorities throughout the Commonwealth. At the same time, however, it had been stressed that blood examinations for drivers of motor vehicles suspected of driving under the influence of intoxicating fluids should always be carried out on a voluntary basis. The General Secretary said that he had asked the various Branches of the Association in Australia to express their views on whether any revision of the existing policy now seemed desirable, in view of the fact that a Select Committee on Road Safety was meeting in Canberra. The Federal Council discussed the matter in the light of the views of the Branches and took no action to alter its existing policy.

Commonwealth Employees Compensation Act, 1930-1956.

A letter was received from the South Australian Branch, referring to an undesirable practice on the part of two different Commonwealth departments, which had communicated with an orthopædic surgeon in South Australia, asking to be supplied with an explanation as to why two employees previously treated by him had been admitted to private rather than public hospitals. The Branch Council pointed out that, apart from the fact that there was no agreement between the insurers and the medical profession concerning fees charged by them to employees of the Commonwealth departments under the *Commonwealth Employees Compensation Act*, the inference to be drawn was that the Commonwealth expected its employees to be treated in public institutions by the members of the honorary medical staff rather than by members engaged in private practice. The Branch Council failed to see the necessity for any medical practitioner to be asked to explain his actions to the Commonwealth under such circumstances, as the selection of an institution in which a patient was to be treated was surely a matter of arrangement between him and the medical practitioner concerned. The Branch Council requested that the attention of the Commonwealth Commissioner for Employees Compensation be drawn to the matter, with the request that such an instruction by him to the various departments under his control be withdrawn. The Council also said that it would be interested to learn whether similar requests had been made to medical practitioners in other States.

The General Secretary said that it had referred the matter to the Branches. The Victorian Branch had forwarded evidence of further instances of the practice mentioned, and the matter was being further investigated.

Superannuation Scheme for Self-Employed Persons.

A letter was received from the Law Council of Australia, forwarding a copy of its submission to the Federal Treasurer in relation to (i) contributions to superannuation funds, (ii) fees outstanding on retirement and (iii) increase in concessional income tax deductions.

Votes of Thanks.

The thanks of the Federal Council were extended to the Council of the Queensland Branch for its hospitality and the use of its offices, and to Dr. A. E. Lee and Dr. D. P. Sapsford for their hospitality. The thanks of the meeting were extended to the President, Dr. H. C. Colville, for presiding and to Dr. J. G. Hunter, Dr. C. J. Ross-Smith and Miss H. Cameron for their services during the meeting.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

KISSING THE BOOK.[1]

[From the *Australasian Medical Gazette, April* 24, 1897.]

We have been informed of a recent case in a New South Wales court where Drs. Chisholm and Coutie declined to be sworn as witnesses in the usual manner and claimed to be sworn by affirmation. The presiding magistrate complied with their request. In that well-known journal, *The Queen—The Lady's Newspaper*, for January 9th 1897 there is an able editorial entitled "Women as Witnesses". We are told by this journal that in France no book is used: the judge swears the witness to speak the truth, and the witness lifting up his right hand, says "I swear it". In Belgium the witness states that he will speak the truth. In Austria the witness is sworn before a crucifix, and swears to speak the truth, no book being used: and the Jews who testify place the right hand on an open Bible. In Spain the act is more elaborate and ceremonial, but the use of the Bible is unknown: whilst in Italy the hand is placed on the open Bible and the witness swears to speak the truth. All these proceedings are much more potent than the English form, in which the witness is not required to speak one word but merely to go through a dumb show of kissing the volume after the officer, usually one of very inferior status, has gabbled through the formula.

"Abroad the witness has to utter the words 'I swear it' after the oath has been read; whereas in England he does not say a syllable, and yet the oath which is not really taken, is legally binding. The English formula is discreditable; it is disgusting and dangerous to public health, and it lessens the reverence for sacred ceremonials." Such is the opinion of a leading lay newspaper.

Correspondence.

PREMEDICATION OF CHILDREN.

Sir: I wonder if Dr. I. R. McDonald's lineage does not hide a Campbell, for only thus can I understand his *unclannish disagreement with a method of premedication* for children which has proved itself not only effective, but safe, over a period of several years. May I make the *following points which seem to have escaped his notice?*

1. The premedication I advocated for these young children was methyl-pentynol ("Oblivon") plus hyoscine in quite large oral dosage. The latter drug makes a great difference. It seems Dr. McDonald's cases had methyl-pentynol alone.

[1] From the original in the Mitchell Library, Sydney.

2. I, too, passed stomach tubes on four successive children so premedicated, only to find that the aspirates were in order one-fifth of an ounce, two-fifths of an ounce, one-fifth of an ounce, and nil. What a difference this is from Dr. McDonald's 8 oz.! He must invoke other causes than alcoholic gastrogogism to explain the fluid which he obtained. A quite large dose of one gramme of methyl-pentynol contains as much alcohol as one half-teaspoonful of guid Scotch whisky, or two and one-half teaspoonfuls of Australian beer—hardly enough to make one's mouth water, let alone one's stomach.

With several of my colleagues, I remain well satisfied with the methyl-pentynol plus hyoscine oral premedication, the ward sisters are pleased with the low level of post-anæsthetic nausea, and the mothers are getting their children home again without respiratory complications despite my clansman's fears to the contrary.

Yours, etc.,

342 Albert Street, East Melbourne.
October 16, 1959.

IAN H. McDONALD.

EXPLOSIVE OR EPISODIC DISORDERS IN CHILDREN AS EPILEPTIC EQUIVALENTS.

SIR: I was very interested that Dr. E. Davis, in his paper "Explosive or Episodic Disorders in Children as Epileptic Equivalents" in this Journal, October 3, 1959, pages 474-481, found the concept of an epileptic equivalent a valuable one. I myself have always found it difficult to understand, and have been rather relieved at its general abandonment, though this has been largely by neglect, I think Penfield[1] being the only person to attack it in print. What I could never grasp was whether it meant that the episodic disorder was actually accompanied by an abnormal pattern of firing of cerebral neurons as in the classical type of epilepsy, or not. If so, why not classify it as such—as, e.g., a temporal lobe seizure or a post-ictal confusional state? If not, in what sense is it "equivalent" to epilepsy? What value is there in describing it as such? Does it mean that the condition responds to treatment with anti-convulsant medication? Not in my experience.

Dr. Davis I think accepts the former view, and suggests the term "psychic epilepsy", which I would agree is markedly superior, as it does say what it means. But why not use the generally accepted term, "temporal lobe epilepsy"? Perhaps relevant to this point was his statement that "psychomotor seizures" can be separated clinically from "psychic seizures", but he does not say how. He associates the former with anterior temporal and the later with mid and posterior temporal electroencephalographic foci, and quotes differences in the clinical features of these conditions in adults, found by Hill.[2] However these differences, though of great theoretical interest, are purely statistical, and could not be used to distinguish an individual case clinically with much more than chance frequency. Of course, this may not be so in children.

However, before it is accepted that these children have psychic epilepsy, more evidence is needed that the episodes are accompanied by abnormal cerebral electrical discharges of the type seen in the classical epilepsies, especially in those children with non-specific abnormalities in their routine electroencephalograms. On this point, Dr. Davis did not comment on the differences between the percentage of abnormal electroencephalograms in his series of 107 patients with behaviour disorder and without "epilepsy", and that in the series of Miller and Lennox quoted by him—viz., 80% as against 35%. In this respect it may be of significance that Dr. Davis includes in his list of abnormal patterns ones which are generally accepted as normal in the age group in his series—e.g., post-temporal slow-wave foci and temporal theta activity. One would be interested to know what percentage of abnormal records Dr. Davis finds in normal children. This figure of course varies both with the encephalographer and with the age of the patient, the percentage of abnormal records decreasing until the age of 40-45 is reached. Hill, for example, in the article mentioned above, finds 25% abnormal records in normals aged 15-20, but just over 10% in those aged 31-40. As Dr. Davis points out, children's records are still more variable and difficult to read.

However, I hope Dr. Davis will agree with me in condemning the use of this term "epileptic equivalent" to describe any episodic behavioural disorder which accompanies a non-specifically abnormal electroencephalogram, without undoubted clinical evidence of its epileptic nature. Otherwise such episodes in psychopaths (70% of whom aged 15-20 and 50% aged 21-30 have abnormal electroencephalograms of this type, according to Hill[2]) and possibly even schizophrenics (37%) could validly be described as epileptic equivalents. The complications in both theory and practice (e.g., medico-legal) would be enormous.

In the present state of our knowledge, can we not agree that temporal lobe lesions can produce both characteristic epileptic seizures and certain personality disorders, just as lesions of the motor cortex can produce a characteristic type of epilepsy and neurological signs? Until it can be proved that a third category is necessary, why introduce it?

Yours, etc.,

Department of Pharmacology, University of Melbourne, Melbourne, Victoria.
October 13, 1959.

N. McCONAGHY.

THE REMOVAL OF IMPACTED CERUMEN.

SIR: In practice one has to deal often with impacted cerumen, which one wants to remove promptly without the few days' "premedication" with "Cerumol", glycerin or other preparations.

I found the following procedure surprisingly quick and effective: Dissolve 1000 Benger Units of "Hyalase" (one ampoule) in approximately 1 ml. of tap water, instil into ear three to six drops of the solution, plug meatus with cotton-wool. After two or three minutes, syringing with body-temperature water will remove wax immediately.

Yours, etc.,

108 Serviceton Avenue, Inala, Brisbane, Q.
October 24, 1959.

J. BALASSA.

CANCER, A DISEASE OF THE NERVOUS SYSTEM.

SIR: In view of the present interest in the ætiology of cancer, and of the fact that there are now some minds prepared to consider the possibility of the psyche playing a major role in the causation of cancer, and as Dr. D'Ombrain has waited so long to get support for the astute and courageous deductions he made in 1933, I will outline, prematurely perhaps, a tentative explanation in terms of neurophysiology and pathology. So far I have only been able to test the hypothesis in six cases. However, neither 16 nor 60 cases would put the matter beyond doubt, and the latter figure is well beyond my opportunities, time or resources.

In previous publications of mine the hypothesis of autonomic dyspraxia was considered only in relationship to non-neoplastic disease. It was proposed that a supra-threshold, emotional crisis could overload the subcortical autonomic centres ("hypothalamus") through the cortico-thalamic tracts, producing a chaotic condition (commotio hypothalami) which would prevent them from properly controlling the autonomic action in a peripheral organ. Normal autonomic control (sympathetic/parasympathetic coordination) of plain muscle, gland or both would fail. As an example, let us consider one of the less controversial diseases. Under a certain emotional load the subcortical autonomic centres of a busy doctor develop commotio hypothalami, and the normal coordination of his gastric muscularis and glands gives way to hypermotility and hyperacidity. Depending on the variable factors of intensity and time, one of two types of reaction could result: In Type I reaction, no local destruction occurs, it is temporary and reversible, and gastritis follows. In Type II reaction, local destruction occurs, it is permanent and irreversible, and gastric ulcer follows. When I found that similar emotional crises with major psychological reaction had occurred during the relevant period of time in the few neoplastic patients who came under my care, the possibility of a third type of reaction had to be considered, which was progressive and fatal and led to gastric cancer.

Whilst Type I and Type II reactions are initially concerned with macroscopic structures such as blood vessles

[1] Penfield, W., and Jasper, H. (1954), "Epilepsy and the Functional Anatomy of the Human Brain", Little, Brown & Co., Boston.

[2] Hill, D. (1952), "EEG in Episodic Psychotic and Psychopathic Behaviour: Classification of Data", *Electroenceph. clin. Neurophysiol.*, 4: 419.

and glands at the very beginning of the pathological mechanism, Type III reactions, neoplasia, occur at the cellular level. It is generally agreed that at the commencement of cancer or other neoplasia, a single cell or small group of cells ceases to function normally and becomes neoplastic. The metabolic processes of each cell are regulated; they are not haphazard. The regulation is effected by the autonomic nervous system. For our present purpose the control of the autonomic nervous system fails under certain conditions of emotional stress.

Let us consider a single cell, one conveniently placed in the scrotum of a Victorian chimney sweep, a basal cell of the skin. Like every other cell in his body, the cell depends for its normal function and survival on the orderly control of its vital processes, of its molecular/electrolyte pattern. This is carried out by the autonomic nervous system through its neurovascular and neurosecretory mechanisms. But the continued presence of carbon particles interferes with normal function. An extremely small proportion of these carbon atoms are radioactive, but I do not wish to labour this point at this stage and depart from the main argument. In the normal course of events the damaged cell reacts with the mechanism of inflammation/repair under the control of the autonomic nervous system. However, we know on the authority of Charles Dickens *et aliquos* that the lot of the Victorian chimney sweep was not a happy one. In the case under consideration, he worked long hours for a brutal master. Several times he had sweated out hours of the death fear, trapped in a narrow flue, to be beaten after rescue for his efforts. The transient commotio hypothalami of a single emotional crisis had passed into the chronic phase. The complicated coordination of the changing neurovascular and neurosecretory reactions involved in the various stages of inflammation/repair failed to occur in their proper sequence and proportions. The molecular/electrolyte composition of the intercellular fluid surrounding our cell changed from the correct formula. As a result the molecular/electrolyte pattern of the cell membrane and cell contents, enzyme systems included, altered. The irritation of the carbon particles continued. It was a prolonged irritation for 24 hours a day for weeks and months on end.

There are alternative possibilities at this stage. The first is the entrance of an enigmatic, spiral cluster of atoms with a thin cytoplasmic covering, a virus. Normally the structure of the cell membrane offers no loose chemical affinities with which the DNA nucleus can react and so effect a penetration into the cytoplasm, where there is an abundance of reactive molecules for its enzymatic chain reactions. Once inside the virus starts the new molecular/electrolyte pattern of neoplasia, the new order, the parabolism of uncontrollable self-destruction.

The geneticists and the biochemists have indicated the near magic of the nucleoprotein molecule DNA. This is the nuclear substance of many cells. It appears to constitute the greater part of the structure of a virus. It can only function actively when surrounded by an abundant cytoplasm with its wealth of foodstuffs. Then it brings about the unique chemical reaction of transforming other substances into itself. So it accumulates in the cell sufficient nuclear material for another cell, and the basic vital process of reproduction is initiated. The nucleoprotein of a virus apparently has this enzymatic action of autoproduction to an enhanced degree—something like the sorcerer's apprentice. If it can gain access to its appropriate medium, the cytoplasm of a suitable cell, it can transform the sugars and amino acids into a great number of nucleoprotein nuclei the same as itself, each possessing the same properties, of course. Eventually they overwhelm the cell and contact the neighbouring cells. Penetration of these neighbouring cells will depend on the phenomenon of mass action, on the state of the autonomic nervous system, or on a combination of both these factors.

An alternative mechanism is that the cellular reaction of producing the lethal nucleoprotein molecules might occur independently of any virus contacting the cell and gaining entry. Through the altered molecular/electrolyte pattern in the cell as the result of defective autonomic control, the chemical reaction produces the nucleoprotein of neoplasia instead of the normal nucleoprotein of its nuclear structure. The rest of the neoplastic parabolism would be the same as in the case of the virus.

To conclude this brief exposition of the role of autonomic dyspraxia in neoplasia I will point out that the spread of cancer through lymph channels, by the blood-stream and in other ways becomes very clear; also latent periods, rapid progress after unsuccessful surgery. Details of cases and appropriate references must await presentation as a paper. In the meantime I hope that my congratulations and support afford Dr. D'Ombrain some satisfaction. I also hope that some authority with the opportunity of funds and facilities will grasp the advantages to be gained in the fight against cancer by exploring this neglected line of research.

Yours, etc.,

BRIAN HAYNES.
Craignish,
185 Macquarie Street,
Sydney, N.S.W.
September 14, 1959.

CANCER OF THE LUNG.

SIR: Dr. Cleland has very rightly pointed out, in his letter of October 24, the value of the comparison of the incidence of non-malignant metaplasia in the bronchial epithelium in smokers and non-smokers. The results of some work which Dr. Oscar Auerbach reported in the *New England Journal of Medicine* some time ago[1] are of interest in this connexion.

Histological observations were recorded on 117 cases in which the traceo-bronchial tree was dived into 208 sections. Of the 117 cases 34, all of whom were smokers, had died of bronchogenic carcinoma; of the rest, who had died of other causes, 16 had never smoked regularly or at all, 20 had smoked under one packet a day and 47 more than one packet per day. Four changes in the bronchial epithelium were evaluated: (i) hyperplasia (three or more cell rows) of the basal cells lying along the tunica propia; (ii) stratification—epithelial lining composed of multiple layers of flattened epithelial cells lying parallel to one another; ciliated cells absent over this zone; (iii) squamous metaplasia—epithelial lining thicker; similar layering of cells, but cells larger and appearance similar to squamous epithelium seen elsewhere; intercellular bridging often seen, but no keratin pearls; (iv) carcinoma-in-situ.

The findings demonstrated clearly that these histological changes were least frequent among patients who had never smoked regularly or who had not smoked at all, with a progressive increase in the moderate and heavy smokers and in cases dying from carcinoma of the bronchus. There was a rather uniform distribution of carcinoma-in-situ throughout the tracheo-bronchial tree.[2] Similar findings were noted not infrequently in sections taken from the cut end of the bronchus in lungs resected for carcinoma of the bronchus at Clare Hall Hospital, London.

The conclusion appears to be that carcinoma of the bronchus is usually part of a widespread change in the bronchial mucosa, and this is fully consistent with the theory that inhalants and in particular cigarette smoking are important factors in its causation.

Yours, etc.,

S. GILLIS.
Morris Hospital,
Adelaide.
October 27, 1959.

THE CHALLENGE AHEAD.

SIR: In answer to Dr. Kinsella, may I say that materialism and idealism are the two classes to one of which every consistent philosophy belongs.

Matter is that of which the universe, including ourselves, is composed, and which exists independently of thought. What matter is, is the subject of scientific investigation, and the complete answer will probably be never given, as matter seems to be infinite. Man is now engaged in probing electrons, and new forms are continually being found.

Materialists consider that scientific investigation—i.e., theory and experiment (practice)—is the only way to knowledge of reality. Every scientist in practice really endorses the materialist view. Knowledge is the key to power—i.e., to the use of nature in the interests of man. Engels's statement that freedom is the appreciation of necessity means exactly that. Socialism, by making the means of production collectively owned, and by efficient scientific education of the people, makes all as free as is possible at the given time in the given state of knowledge.

Pace Dr. Kinsella, Marxism knows no ultimate haven, no cessation of contradictions. That belongs to idealism with its paradises, Nirvanas etc.

[1] *New Engl. J. Med.*, 1957, 256: 97.
[2] Auerbach, personal communication, 1958.

The Nazis are idealists and supporters of capitalism, therefore fierce antagonists of the communists. The relations of the Vatican with the Nazis and their allies, Mussolini's Fascists, should have made it impossible for Dr. Kinsella to allege a "common foundation" for Nazism and communism. As for the slanders so freely voiced by Dr. Kinsella, they are wholly untrue. If he wants a really good example of genocide, let him study the history of the Albigenses. And that is by no means the first in history, but possibly the most complete.

Is Marxism-Leninism—i.e., communist theory—really scientific? That is the 60-dollar question, as the Yankees say. As the evolution of world politics in this century has faithfully followed the path predicted by Marx and Lenin on the basis of their investigations, as their theory has been vindicated by practice, the answer to the question must be "yes".

It surely is illogical for medical men to be scientific in medicine and surgery and unscientific in politics.

Dr. Kinsella alleges slaughter of Koreans, Vietnamese, Hungarians and Tibetans by Marxists. The Korean civil war was begun at the instigation and with aid of the U.S.A. The Vietnamese fought a glorious and successful war for independence against the French. The Hungarians defeated a counter-revolution with the help of the Soviet Union. A successful counter-revolution with the aid of U.S.A., England and France in 1919 established Fascism in Hungary and made her in the end an ally of Hitler. As for the Tibetans, the attempt of feudal lords and reactionary clergy to continue a most barbarous theocratic feudalism has been defeated, and surely every lover of humanity must rejoice.

Dr. Kinsella might take into consideration the two World Wars of this century, which were certainly the product of capitalism, and the destruction they caused, in comparison with which his anti-communist allegations, even if true, would seem trifling.

Really, Dr. Kinsella will soon find himself with those who say the world is flat, that the sun goes round the earth, that vivisection is immoral, that evolution is blasphemous, that surgery is criminal and so on. A new idea always meets opposition, but in the end wins practically universal support. Marxism today is rapidly winning a victory in the minds of men.

Yours, etc.,

G. P. O'DAY.

196 Nepean Highway,
Aspendale, Victoria.
October 19, 1959.

Notes and News.

Fourteenth Annual Symposium on Fundamental Cancer Research.

The University of Texas M. D. Anderson Hospital and Tumor Institute announces that the fourteenth annual symposium on fundamental cancer research, "Cell Physiology of Neoplasia", will be held on February 25, 26 and 27, 1960. The hospital, which sponsors the symposium each year, will be assisted by the University of Texas Post-Graduate School of Medicine. The American Cancer Society, Texas Division, the Texas State Department of Public Health and the National Cancer Institute, United States Public Health Service, contribute to the support of the meeting. The programme includes the following: morphology of cells, behaviour of organelles, submicroscopic structures, cytochemistry, growth phenomena, and biochemical properties of cells. Further information relating to the symposium may be obtained by writing to the Editorial Office, University of Texas M. D. Anderson Hospital, Texas Medical Center, Houston 25, Texas.

Salk Vaccination in Western Australia.

The Honourable R. Hutchinson, Minister for Health of Western Australia, has given the following details relating to Salk vaccination in that State up to October 21, 1959.

Since July, 1956, when the Salk vaccination programme began, 233,481 persons under the age of 15 years have been inoculated, and approximately 80% of these have completed the full course of immunization. The present population under the age of 15 years is unknown, but as there were only 194,750 at the time of the 1954 census, it is clear that the child immunization rate must be among the highest in the world.

The status of adult immunization, however, is by no means satisfactory. So far only 209,674 persons over 15 years have had one or more injections, and only 45% of these have completed the full course. At the time of the 1954 census there were 445,021 persons in Western Australia aged over 15 years, and this number has increased in the years since. It is estimated, therefore, that at least 250,000 adults are without Salk protection and another 100,000 are inadequately protected.

Outbreaks during the recent summer in North America mainly involved unvaccinated groups, and in the event of similar outbreaks in Australia during the coming summer, it is essential that the highest rate of adult immunization be achieved during the next three months. In the past, outbreaks of this disease have tended to develop during the months of January and February, and it is common prudence for all uninoculated adults to seek immunization within the next few weeks.

American College of Chest Physicians: Prize Essay Contest.

The American College of Chest Physicians is offering three cash awards to winners of the 1960 prize essay contest. The prizes are as follows: first, $500; second $300; third, $200. Each winner will also receive a certificate. The contest, which closes on April 1, 1960, is open to undergraduate medical students throughout the world. Essays may be written on any phase of the diagnosis and treatment of chest diseases, cardio-vascular or pulmonary. Application forms and further information may be obtained by writing to the American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois, U.S.A.

Naval, Military and Air Force.

APPOINTMENTS.

THE following appointments, changes etc. are published in the *Commonwealth of Australia Gazette*, No. 55, of September 3, 1959.

NAVAL FORCES OF THE COMMONWEALTH.

Permanent Naval Forces of the Commonwealth (Sea-Going Forces).

Confirmation in Rank.—Surgeon Lieutenant (on probation) Noel Daniele Panettiere is confirmed in the rank of Surgeon Lieutenant (for Short Service), with seniority in rank of 31st March, 1958, dated 1st May, 1959.

Citizen Naval Forces of the Commonwealth.

Royal Australian Naval Reserve.

Promotions.—Surgeon Lieutenants Andrew Keith Frazer and William Valentine Doherty are promoted to the rank of Surgeon Lieutenant-Commander, dated 1st August, 1958, and 10th June, 1959, respectively.

AUSTRALIAN MILITARY FORCES.

Citizen Military Forces.

Northern Command.

Royal Australian Army Medical Corps (Medical).—2/146600 Captain (provisionally) R. G. R. Sim relinquishes the provisional rank of Captain, 19th July, 1959, is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Northern Command), in the honorary rank of Captain, 20th July, 1959.

Southern Command.

Royal Australian Army Medical Corps (Medical).—3/101046 Captain (provisionally) E. J. Keogh, is seconded whilst in the United Kingdom, 25th June, 1959.

Central Command.

Royal Australian Army Medical Corps (Medical).—4/32073 Captain J. S. T. Cox is seconded whilst in the United Kingdom, 25th June, 1956.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps (Medical).

Eastern Command.—Honorary Captain H. J. Eizenberg is retired, 30th April, 1959. *To be Major (Honorary Lieutenant-Colonel), 22nd July, 1959*—John Walton Spence.

The following officer is placed upon the Retired List (Eastern Command), with permission to retain his rank and wear the prescribed uniform, 28th February, 1959.

Lieutenant-Colonel (Honorary Colonel) G. G. L. Stening, E.D.

The following officers are placed upon the Retired List (Eastern Command) with permission to retain their rank and wear the prescribed uniform, 30th April, 1959.

Majors C. S. Colvin and N. Rau and Captain (Honorary Major) M. W. Ginsberg.

The following officers are placed upon the Retired List (Eastern Command), with permission to retain their rank and wear the prescribed uniform, 30th June, 1959.

Major P. F. Murphy and Captain F. B. Uther.

The following officers are placed upon the Retired List (Central Command), with permission to retain their rank and wear the prescribed uniform, 31st August, 1959.

Lieutenant-Colonel N. P. Wilson, Captain (Honorary Major) D. G. McKay and Captain J. F. F. Drew.

The following officer is placed upon the Retired List (Western Command), with permission to retain his rank and wear the prescribed uniform, 31st August, 1959.

Captain H. H. R. Nash.

Retired List.

Royal Australian Army Medical Corps (Medical).

Central Command.—Honorary Captains B. E. Lawrence and K. C. Scutt are retired, 31st August, 1959.

Public Health.

POLICE OFFENCES (AMENDMENT) ACT, 1908, AS AMENDED, OF NEW SOUTH WALES.

THE Under Secretary, Chief Secretary's Department of New South Wales, has requested that publicity be given to the following proclamation, which was gazetted on October 30, 1959, applying Part VI of the *Police Offences (Amendment) Act* to normorphine and dimenoxadol. The proclamation will come into effect on May 1, 1960.

PROCLAMATION.

(L.S.)

E. W. WOODWARD

Governor

I, Lieutenant-General Sir Eric Winslow Woodward, Governor of the State of New South Wales, with the advice of the Executive Council, do, by this my Proclamation, declare that Part VI of the Police Offences (Amendment) Act, 1908, as amended, shall apply to:

Normorphine (N-demethylated morphine) its salts, and any preparation, admixture, extract or other substance containing normorphine.

Dimenoxadol (dimethylaminoethyl 1-ethoxy-1, 1-diphenylacetate), its salts and any preparation, admixture, extract or other substance containing dimenoxadol,

in the same manner as it applies to the drugs mentioned in paragraph (a) of subsection (2) of Section 18 of the said Act.

I hereby declare that this my Proclamation shall take effect on and from 1st May, 1960.

Signed and sealed this seventh day of October, one thousand nine hundred and fifty-nine.

By His Excellency's Command,

C. A. KELLY.

GOD SAVE THE QUEEN!

Medical Appointments.

The undermentioned appointments have been made at The Queen Elizabeth Hospital, Adelaide.

Dr. R. H. C. Rischbieth has been appointed Honorary Neurologist (with status of Assistant Physician).

Dr. S. C. Milazzo has been appointed Honorary Rheumatologist (with status of Assistant Physician).

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED OCTOBER 10, 1959.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	1(1)	7(3)	2(1)	..	..	..	..	..	10
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	..	..	2	..	..	..	2	..	4
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	..	..	..	..	..	..	..	..	..
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	..	8(7)	10(4)	..	2(1)	1	1	2	24
Diphtheria	..	..	..	..	4	..	..	..	4
Dysentery (Bacillary)	..	..	2	..	..	..	1	..	3
Encephalitis	..	..	..	..	..	..	..	..	..
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	1	..	..	1
Infective Hepatitis	59(8)	26(20)	16(7)	21(12)	..	..	..	..	122
Lead Poisoning	..	..	3(1)	..	..	..	..	..	3
Leprosy	..	..	..	..	..	..	1	..	1
Leptospirosis	..	..	1	..	..	..	..	..	1
Malaria	..	..	1	..	..	..	..	..	1
Meningococcal Infection	3(1)	3(3)	..	..	..	..	..	..	6
Ophthalmia	..	..	..	..	..	..	..	..	..
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	1(1)	..	..	1
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	..	..	..	..	..	..	..	..	..
Puerperal Fever	..	..	1	..	..	..	..	..	1
Rubella	..	21(10)	..	2	1(1)	..	..	1	25
Salmonella Infection	..	..	..	1(1)	2(2)	..	1	..	4
Scarlet Fever	11(4)	7(5)	2(1)	9(9)	..	1	..	..	30
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	..	..	..	..	1	..	1
Trachoma	..	..	..	..	..	..	3	..	3
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	45	14(12)	14(6)	4(3)	13(8)	5(3)	..	..	95
Typhoid Fever	1(1)	..	1(1)	..	..	..	..	..	2
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	..	..	..	..	..
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

Dr. C. H. Pryor has been appointed Honorary Assistant Anæsthetist in the Department of Anæsthesia.

Dr. J. K. Pavy has been appointed Honorary Clinical Assistant Anæsthetist in the Department of Anæsthesia.

The undermentioned appointments have been made at the Royal Adelaide Hospital, Adelaide.

Dr. H. Lander has been appointed Honorary Assistant Physician in the Professorial Medical Unit.

Dr. D. E. Nairn has been appointed Honorary Clinical Assistant in the Radiological Department.

Dr. J. D. Lister has been appointed Honorary Clinical Assistant in the Ophthalmic Department.

Dr. M. Y. Sheppard has been appointed Honorary Clinical Assistant in the Orthopædic Department.

Dr. M. L. Welby has been appointed Honorary Clinical Assistant, Professorial Medical Unit.

Dr. P. H. Wilson has been appointed Senior Resident Medical Officer.

Dr. J. S. Skipper and Dr. L. J. Rice have been appointed Supernumerary Honorary Clinical Assistants in the University Department of Obstetrics and Gynæcology at the Queen Elizabeth Hospital, Adelaide.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Lecture by Professor R. J. Rossiter.

THE Post-Graduate Committee in Medicine in the University of Sydney announces the following lecture in the annual subscription course. Professor R. J. Rossiter, Professor of Biochemistry in the University of Western Ontario, will lecture on "The Biochemistry of Demyelination" on Wednesday, November 25, 1959, at 12 noon, at the Maitland Lecture Theatre, Sydney Hospital.

SURGICAL SEMINAR AT ST. VINCENT'S HOSPITAL, SYDNEY.

A SURGICAL SEMINAR will be held at St. Vincent's Hospital, Sydney, on November 30, 1959, at 5.15 p.m., in the fifth floor lecture theatre. The speaker will be Mr. Walter McGrath, who will discuss "Cancer of the Thyroid Gland".

Notice.

BRITISH MEDICAL ASSOCIATION: N.S.W. BRANCH.

Special Group of Neurology and Psychiatry.

A CHANGE has become necessary in the venue of the annual dinner arranged by the Special Group of Neurology and Psychiatry of the N.S.W. Branch of the B.M.A. The dinner was to have been held at Cahill's A.P.A. Restaurant, corner of Martin Place and Elizabeth Street, Sydney. Owing to the fact that Cahill's have left that address, the dinner will now be held at Cahill's Tudor Restaurant, 33 Martin Place, Sydney (telephone BW 4177). The date, November 20, is unchanged, and the time is 6 p.m.

THE CHILDREN'S MEDICAL RESEARCH FOUNDATION OF N.S.W.

THE following is a list of donations to the Children's Medical Research Foundation of N.S.W. received from members of the medical profession in the period October 14 to 28, 1959:

Dr. D. E. Barton (further) £10 10s. 6d.

Dr. Wallace Freeborn (further), Dr. and Mrs. James Furber (further), Dr. Felix Arden (further), Dr. R. H. Macdonald (further), £10 10s.

Dr. A. E. Colvin (further), Dr. A. L. Bryant (further), Dr. R. T. Stannard £10.

Dr. A. V. Medenis £6.

Dr. and Mrs. G. R. Elliott (further), £5 5s. 6d.

Dr. M. Gilchrist (further), Dr. and Mrs. W. H. Howell (further), Dr. M. A. Coull, Dr. J. B. Wilson (further), Dr. Z. Kline (further), Dr. Robert Burns (further), Dr. K. S. Alexander (further), Dr. Arthur Moon (further), £5 5s.

Dr. I. Frischer (further), Dr. N. M. Kater (further), Sir Norman Kater (further), Dr. R. Kent Burnett (further) £5.

Dr. K. G. Outhred (further), Dr. R. A. Durie (further) £3.

Dr. J. H. Mason £2 2s.

Previously acknowledged: £9418 8s. 4d. Total received to date £9582 6s. 4d.

Diary for the Month.

NOVEMBER 16.—Victorian Branch, B.M.A.: Finance Subcommittee.
NOVEMBER 17.—New South Wales Branch, B.M.A.: Medical Politics Committee.
NOVEMBER 18.—Victorian Branch, B.M.A.: Clinical Meeting at the Neuro-surgical Unit, Mont Park.
NOVEMBER 19.—New South Wales Branch, B.M.A.: Clinical Meeting.
NOVEMBER 19.—Victorian Branch, B.M.A.: Executive of Branch Council.
NOVEMBER 24.—New South Wales Branch, B.M.A.: Hospitals Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations, other than those normally used by the Journal, and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference to an article in a journal the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of article. In a reference to a book the following information should be given: surname of author, initials of author, year of publication, full title of book, publisher, place of publication, page number (where relevant). The abbreviations used for the titles of journals are those of the list known as "World Medical Periodicals" (published by the World Medical Association). If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

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